

Brussels,
BE



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«Places for making in the heart of a service oriented city-region.»

Brussels was one of the pioneering centres of the industrial revolution in mainland Europe while now claiming one of the lowest levels of manufacturing for a European city. It is a city of two language groups, the seat of three capitals, it is perhaps Europe's most cosmopolitan region with one of Europe's highest per capita incomes rates while suffering some of the highest levels of unemployment for a major European centre.

Until the 1960's, some 60% of jobs were associated with industrial activities - making Brussels one of the most industrial centres per capita in Europe. The city was home to a diverse manufacturing sector, specialising in metals, printing and vehicle production thanks to one of Europe's densest rail networks drawing in a vast pool of labor from the Flemish and Walloon hinterland. It was supported by stable coal supplies in the Ardennes, access to a large local consumer market in Belgium and beyond and its good location on the canal and a rail route connecting Paris to Cologne and Amsterdam.

However since the 1960's, the city experienced a radical transformation of its economy. The development of the service sector, and growth of its international functions and European institutions, have rendered Brussels one of the least industrial cities in Europe, with industrial jobs representing less than 3% of total employment. The process of relocating Brussels' manufacturing continues. Industry and productive activities in general have been weakened by demands for housing and office space, focusing on the highly mixed inner-city workers' neighbourhoods which are being acquired by both private and public developers. Unemployment rates ranging from 20-40% are common in some neighbourhoods, putting pressure on politicians to look for replacements for lower skilled jobs that industry once offered.

Manufacturing activities are far from gone. Brussels is home to two major assembly plants (Audi and SABCA), a host of niche biotech firms and specialists in sensor based technology. Furthermore, with an ambitious regional circular economy plan, pioneering development in grass-roots social innovation and greater integration of socio-economic actors within the local economy, Brussels is positioning itself, albeit informally, as a hub for locally focused making.

2.1 Brussels' manufacturing: a brief history

From being a pioneering industrial centres, claiming more than half of the city's jobs, Brussels now contains one of the lowest rates of urban manufacturing in any European city and has arrived at a new crossroads in its productive future.

FROM EARLY MANUFACTURING TO THE INDUSTRIAL REVOLUTION

Brussels' 'manufacturing spirit' can be traced to the region's infamous Flemish textile production from the 13th century¹. In the 16th century, the Dukes of Brabant favoured the city over many others for their court, marking its economic and political role thereafter. Over various dynasties, the political power remained linked to the seat of the Duchy until the Belgian revolution of 1830 where Belgium was formed as a buffer state and Brussels was proclaimed capital. Saxon born King Leopold I, married the daughter of King George IV (of England), accepting the throne in 1831 and quickly brokered the first import of revolutionary rail and industrial technology, pioneered in the UK. Brussels claims mainland Europe's first railway.

The 18th century Charleroi Canal enabled coal to be imported on a massive

scale and the mechanisation of industry led to the appearance of foundries, engineering and metalworking companies along with the development of the railway network. The city also attracted administrative and higher class workers that represented both a valuable consumer and investor market, thus kickstarting local manufacturing. Manufacturing sectors included vehicle bodywork, printing and porcelain obtaining international reputation while chemical processing developed to supported related industries such as textiles.

During the 19th century, industry – and particularly metallurgy – grew with a reliable cheap source of coal from the Meuse Valley. Urban populations increased rapidly, Brussels grew from 210,000 in 1846 to almost a million a century later. Furthermore, Belgium laid out the continent's densest rail network that created

Brussels' abattoirs
at the turn of the
20th century.
Author unknown



one of the first intercity commuter workforces, linking the densely populated agricultural hinterland with the city. These factors turned the capital into the largest industrial centre in Belgium with the highest concentration of industrial workers: a title the city retained from 1890 until 1970². The Canal area, in the lowest part of the city was most attractive for manufacturing as it was connected to train stations and raw materials supplied along the canal (such as coal) while forming a richly knit urban fabric of housing and manufacturing.

Whereas the larger (former) industrial areas are located along the canal zone such as Buda, on the northern fringe and Anderlecht-Forest on the southern one, small and medium-sized family businesses are located on either side of the central section of this axis. It was thanks to the emergence of new industries such as crockery production, carriage-making and printing (18th century) that a large

number of factories were built just outside of the medieval walls, in places such as Anderlecht and Molenbeek which lined the canal. While manufacturers grew up along the central axis of the Senne valley, other small to medium activities spread within the very dense urban fabric, filling in the interior of housing blocks and replacing private gardens, adapting existing residential buildings or colonising vacant plots. That process has created highly mixed and unplanned manufacturing neighbourhoods that are still visible today in areas such as Cureghem, Saint Gilles, Evere and others that emerged in the city's rapid late 19th century growth period.

MANUFACTURING PEAK (1900-1960)

Industrial Brussels reached its climax during the early 20th century, focusing on high skilled labor and a conveniently high concentration of clients living in the city.



Citroën Building, Brussels.
Source unknown.



A diversity of small scale manufacturers were developing in Brussels especially thanks to production of machines (vehicles and engines) and consumption-oriented businesses.

After the Second World War, the economic structure of Brussels was still in good shape compared to other European cities. The Belgian capital was developing with a widening middle class, spurred by economic growth, public work plans and mass consumption³. The average size of companies significantly increased, with the investments of multinational organisations in Brussels' manufacturing⁴. The city managed to keep a wide range of activities. By the end of WWII the major manufacturing sectors included (by ascending order) construction of machines, clothing, agro-food, metallurgy, chemicals and printing/binding - directly employing some 166.000⁵ people in 1960.

DEINDUSTRIALISATION, A BRUSSELS-CAPITAL REGION AND NEOLIBERALISM (1960-2010)

Since the second World War, urban manufacturing occupied large amounts of space while employing low qualified labor⁶. Post war economic development saw native Belgians shifting into the tertiary sector and thus demands for skilled workers attracted immigrants initially from Greece, Spain and Italy and later from Morocco, Turkey and the former African colonies - with certain assumption that these workers would later return to the their countries of origin when the work dried up.

While the aftermath of the second world war was blowing life back into the industrial sector, a new industry emerged: the services sector. The arrival of European institutions in the 1960's and the large ecosystem of lobbies and services attached to it have taken over various former workers' neighbourhoods and industrial zones in the east of the city while bringing with it higher paid jobs. Furthermore the federalising of the coun-

try in the 1980's, resulted in a complex bureaucratic stew that would also be headquartered in the city and land largely on former industrial land or blue-collar neighbourhoods around the north and south train stations. Finally, the Brussels Capital Region (RBC) was created in 1989, drawing a 160km² island within the Flemish region, amassing 1,2 million people into almost a city state.

BRUSSELS AND MANUFACTURING TODAY

Brussels, despite a formidable place in Europe's industrial heritage, has now one of the smallest industrial sectors (as a percentage of the economy) while also having one of the highest GDPs per capita in a European city⁷. Industry accounts for around 6% of the regional economy⁸, for which 3% can be attributed to manufacturing. The sector consists largely of the construction/assembly of vehicles (cars and plane parts), chemical refining, agro-food processing and a large number of smaller specialist businesses. Despite some four decades of steady decline in the industrial sector⁹ the sector appears to have a minor but stable place in the larger economy¹⁰. Beyond pure manufacturing, there are a range of other sectors that have also an important role to play in terms of manufacturing such as the construction and recycling.

The region is a compact 160km² city-state while having a significantly larger daily urban network that depends on the city yet which the city has little influence over. The city attracts some 330,000 commuters per day¹¹ into the city (¼ of the resident population) that work largely in the services sector yet also place serious pressure on the mobility network in and out of the city. The industrial activity on the other side of the border is significantly higher (in the order of 10% of employment) and contains a range of manufacturing sites that depend on Brussels yet is largely ignored by regional planning. Due to this regionalism and politicisation of territorial

planning, some of the Region's planning agencies are attempting to avoid losing further productive space or manufacturing jobs.

The shift from Brussels' industrial heritage to its largely services based economy has left a number of unanswered riddles. Firstly, much of the migrant population that arrived since the 1960's has remained and grown, yet some of the communities (and their families) have struggled to adapt to 21st century service oriented jobs and now are heavily represented in the city's 17% unemployment¹² (24% for youth). Secondly, unlike many other European cities, Brussels' inner neighbourhoods account for some of the poorest in the country made up predominantly of residents with immigrant heritage. These neighbourhoods (such as Anderlecht, Molenbeek and Schaerbeek) contain the most dynamic mixture of residential and industrial buildings, yet are under serious pressure from the real-estate market for gentrification. Finally, the fundamental narrative driven by the government (and supported by the real estate sector) is the need for housing without much foresight for the larger impact on the very informal local economies in these neighbourhoods (such as the second-hand car sales in Cureghem) or the types of housing that will be built (currently the market is focused on middle class housing).

New legislation is allowing housing to be included on land zoned industrial (ZEMU, see below), while the public actors driving the zoning have little knowledge of the types of productive functions (from manufacturing to logistics) that could be compatible with housing. The city's manufacturers remain a quiet voice within the political arena and their needs are rarely prioritised over the needs of other land uses (such as housing, open space or commercial space). The question of what type of manufacturing is relevant to Brussels remains a serious challenge for many public actors and community groups whom are aware of the pressing

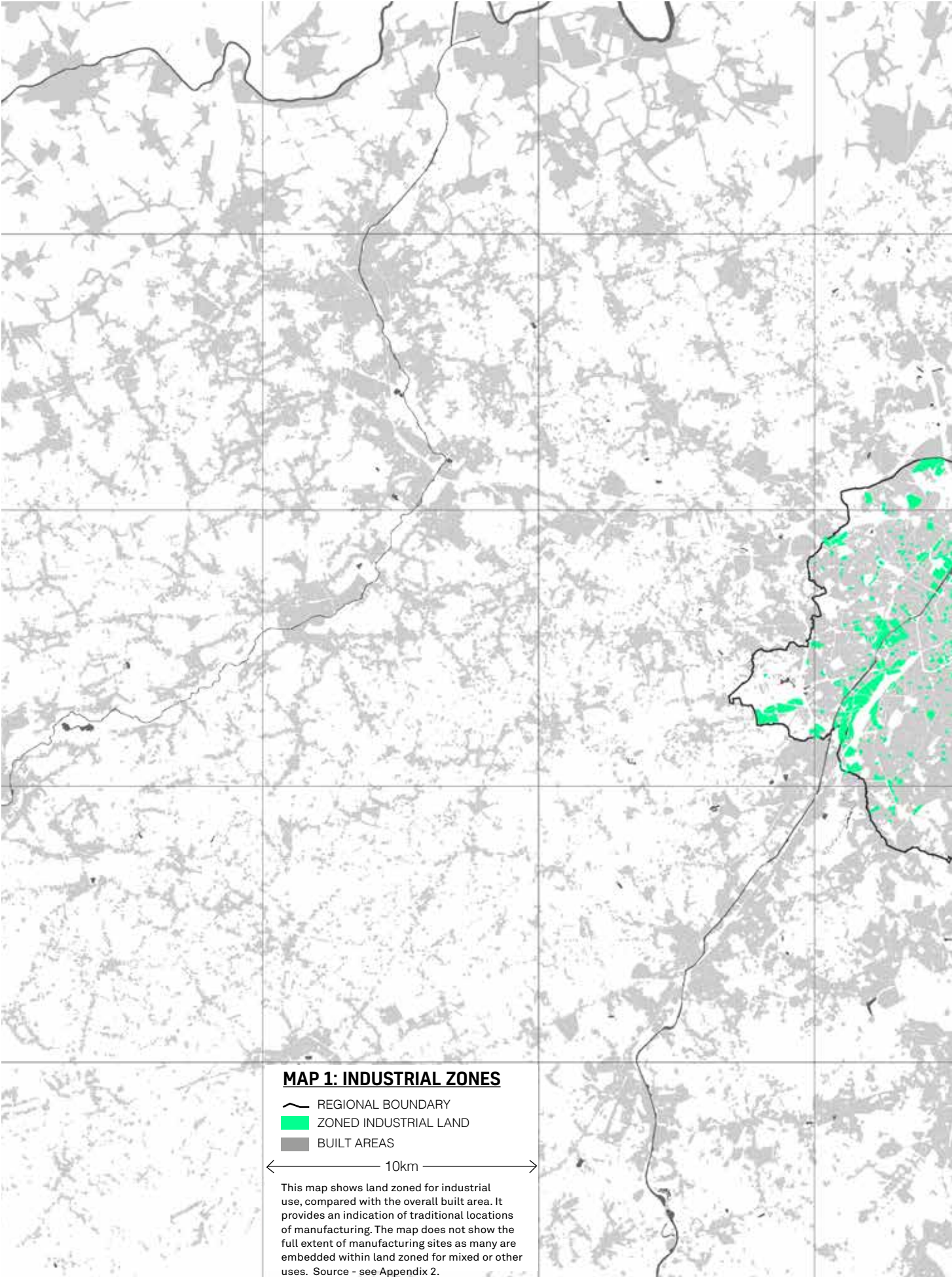
tide of change facing the little remaining protected productive land currently zoned industrial.

In 2018 the Region has scheduled to launch an 'Industrial Plan', essentially to place this question on the political agenda. However the outcome of the plan may further stress the declining trend of manufacturing rather than look towards new forms of urban manufacturing. The implications of external forces such as Brexit and growth of the European institutions, will also place a heavy accent on housing and office space at the expense of affordable places for making.

Brussels is home to Belgium's largest student and research population. The region educates some 104,000 tertiary students annually and employs 26,000¹³ researchers representing 10% and 2% of the population respectively. It is also seeding the largest number of Belgian startups - some 2/5 call Brussels home. This proves a serious niche for both manufacturing (in prototyping or production) and the technical skills that come with it¹⁴. Whether this remains in the realm of activities founded in the 20th century such as cars and chocolates or if it will move towards more contemporary high-tech production of sensors and decentralised value-added manufacturing, remains yet to be seen.



Citroën Building,
Brussels.
Source unknown.





2.2 Manufacturing sectors and trends

From food production to modern electric vehicles, Brussels contains a small but diverse manufacturing sector that has persisted through half a century of radical change. Despite the intriguing variety of makers, few are confident of their place in the city within years to come.

WHAT IS MADE IN BRUSSELS TODAY

Despite the size of the overall sector, Brussels contains some striking examples of manufacturing as will be illustrated within this chapter. For example, the Audi car factory and SABCA are high-tech based vehicle manufacturers born out of early 20th century factories, employing a few thousand high-skilled workers who mainly oversee expensive robots. A number of agro-food producers including those focused on servicing the local market such as one of the last urban abattoirs in Europe. Other confectionery producers focused on export such as the breweries and some Belgium's most international chocolate names (such as Leonidas and Godiva). More recently, with support from regional planning particularly through the Regional Circular Economy Plan (PREC), a circular model is emerging. A range of other manufacturers have also established that have not grown out of the city's industrial past while producing solutions to urban challenges including folding bikes, medical equipment and air quality sensors.

Existing manufacturing companies fit between two extremes: those that can be integrated in mixed zones (including housing) to those that require dedicated industrial zones. New redevelopment plans of former industrial areas (such as the Plan Canal) and policies for mixed developments (ZEMU) go hand in hand with the struggle to define the nature of compatible urban industrial functions. As local businesses rarely federate their interests, they are highly vulnerable to land use changes or complaints from residential areas as public authorities imposing tighter and tighter restrictions on noise, dust, deliveries and other nuisances.

Many companies are neither owners of their land or comfortable on their site. Intra-Brussels relocations have increased steadily (62% in 2009 and 84% in 2012)¹⁵. Currently more than 4 out of 5 requests from companies looking to find a better location than their current location are unmet. This represents more than 200 applications per year. In 2012, 234 new applications were registered, totaling

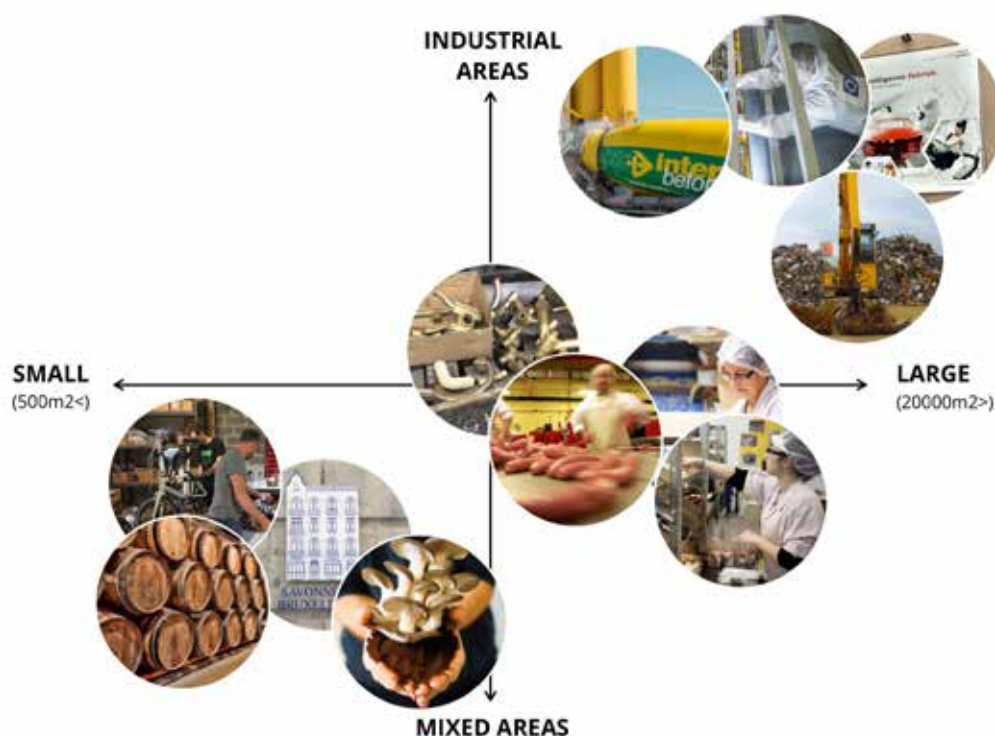
8,956 jobs. The main reason cited is accessibility: Brussels' is also a European capital for traffic congestion while car parking is considered limited where many businesses want it. In other words, one of the most present factors in terms of business relocation is the question of mobility.

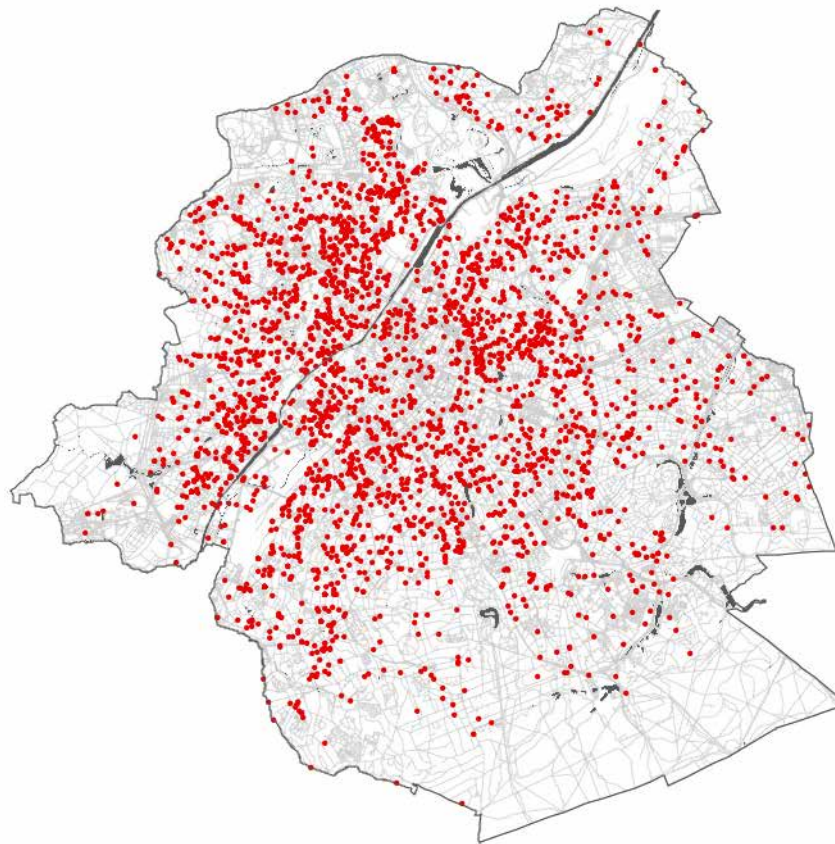
Another key question is the availability of space to satisfy all the applications. Out of the 700,000 m² of buildings (above 1,000 m²) listed as empty, only 223,000 m² (33%) are on the market¹⁶. However, these 223,000 m² represent only 5% of the existing stock meaning that another 15% is un- or under-used. Based on feedback from Citydev, the regional developer of new industrial spaces, the market for semi-industrial space is currently in great demand and particularly for smaller sites (150-300sqm). Moreover, among the 5% of buildings available on the market, many owners prefer to rezone or repurpose their buildings for the far more profitable housing market, leading to a real and serious shortage in solutions for establishing businesses in the Brussels Region.

In Brussels and its fringes there is a constellation of activities that can fall into the definition of "urban manufacturing". Over the following pages, we will present a number of sectors based on a combination of their theme, type of skilled workers and knowledge workers including: vehicle industry, agro-food, construction and material recycling, printing and bio-tech/chemical. Furthermore, with Brussels' focus on the Circular Economy and fundamental mobility challenges, there are a number of related services that cannot cleanly be treated as manufacturing but for which Brussels based manufacturing is dependent on - including recycling, repairs and logistics.

Over the following pages, these sectors will be described and illustrated with a map presenting locations of businesses who fall into the relevant categories. While the maps offer some clues on where the sectors are located, they offer a better illustration of the challenge to link geographic data with manufacturing data across the city.

The diversity of
Brussels' actors





Map 2:
Mechanical
industries

Source:
see Appendix 2



Audi factory, Forest
© Adrian Hill

Mechanical production

The at one end of the vehicle industry sits three big companies hiring middle skilled to low skilled factory workers. At the other end, there are a significant number of smaller companies, accounting for 720 jobs (with a lot of low skill positions) within SME's of under 50 staff, consisting of garages and car-repair workshops¹⁷.

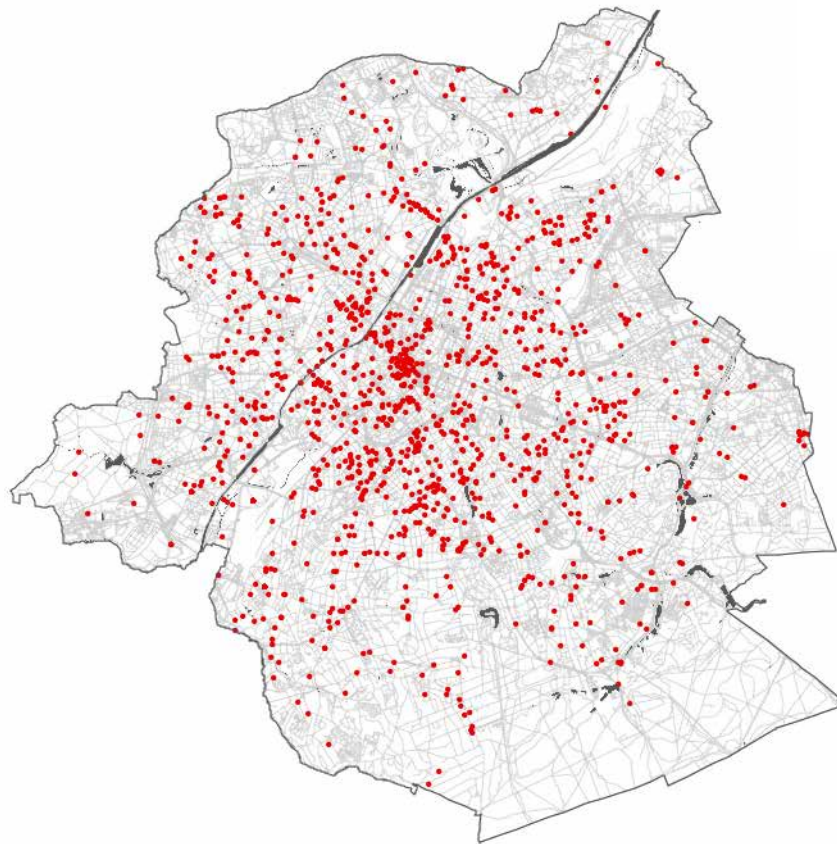
The automobile industry is still in growth in Belgium but

also in Europe and the international capital is quite important in the sector¹⁸. The Audi Forest plant, with largely middle skilled labour and some engineers, employs almost 3,000 workers and is now producing the company's flagship electric car with large financial contributions from public institutions²⁰. SABCA in the North of Brussels produces high-tech parts for the both the defence and commercial aerospace sector, employing a little over 1,000 engineers and specialised skilled workers and connected historically to the airport²¹. From the time of the pioneers of aviation, Belgium was at the forefront in research and aeronautical construction.

Today, whether in Wallonia or Brussels, aeronautics is one of an attractive employment sector for engineers with representation by the Brussels

Aeronautical Group (www.bag.brussels). The companies²² in the sector are in constant search for qualified personnel, some staff available locally while others are imported. The process from concept to production is highly intertwined as feedback between research and production needs to be very responsive to avoid unnecessary issues therefore design and construction are often located on the same site or building. There is also a very strong link between the mechanics and software, resulting in a lot of in-house training.

The Brussels' region public transport company (STIB / MIVB) is the capital's largest employer²³ (some 8200 employees in 2016) and covers the maintenance and upgrade of a vast range of vehicles from trams, metro carriages and buses. While a relatively small



Map 3:
Agro - food

Source:
see Appendix 2

number of employees are dedicated to maintenance, their repair skills could be interchangeable with other mechanical based manufacturers such as the local folding bike producer, Ahooga or luxury tap-maker RVB.

The debate on the future of Brussels' large-scale urban industry has to deal particularly with the largest industrial plants in the region. In addition to those, there are several other functions necessary to facilitate the design and production: customer support (assistance during the design, manufacturing and repair phases), logistics (order management and inventory) and procurement (negotiation of contracts for parts and services).

The complexity of the larger ecosystem raises several questions that are mainly linked to their

expansion, sourcing personnel, training and particularly mobility (for goods and workers). Furthermore, there was only 11% of Brussels residents among Audi employees in 2017²⁵.

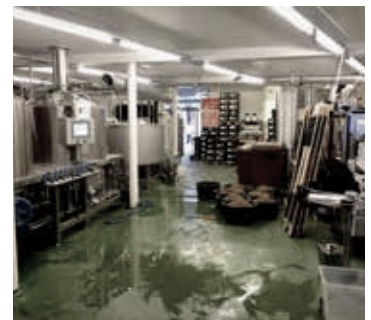
Agro-food

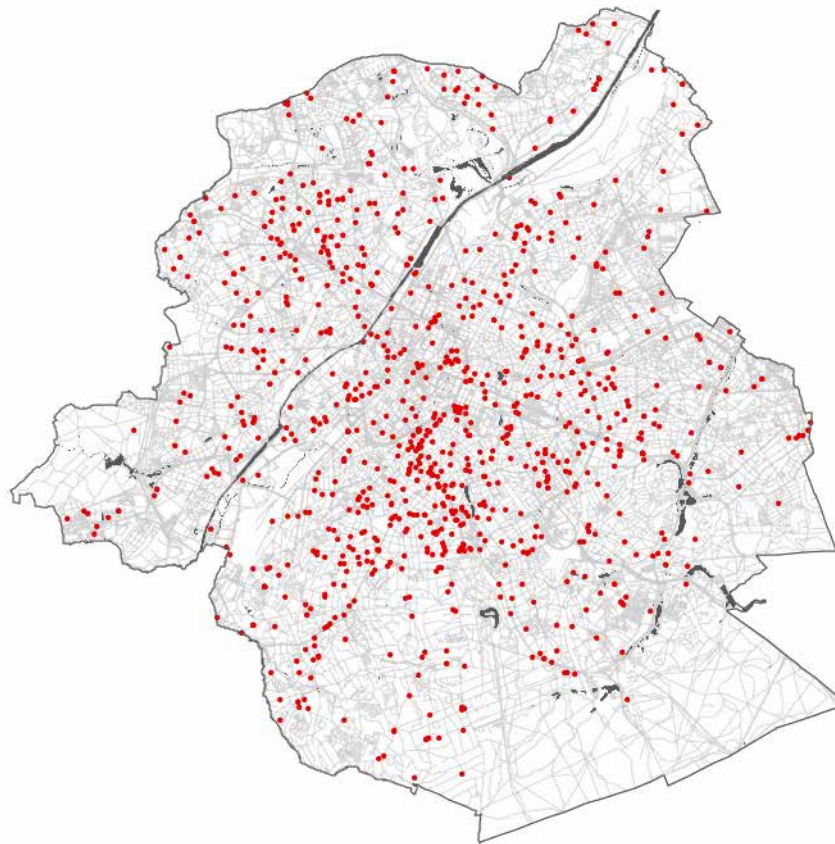
The food industry is one of the most elementary but overlooked sectors in urban manufacturing. It plays an important role, not only in production but also in the chain of sales and distribution as many manufacturers are also retailers of their own products. The activities can be industrial or artisanal and ranges from the very essential such as baked goods and dairy products to craft beer and luxury sweets (a caveat here as pralines are a Belgian staple). Specialty beer, chocolates and biscuits are but the few perishable

products that Brussels produces for the export market.

At one end, the bigger companies consist of Neuhaus, Godiva, Leonidas, Wittamer and Marcolini producing sweets and chocolates firstly for the local and to a varying degree for export. There are industrial bakeries such as Ceres and Milcamps focusing on the national market. In recent years, a

Brussels Beer
Project
© Adrian Hill





Map 4:
Bio-tech
Chemical industries

Source:
see Appendix 2

number of local breweries have appeared - such as Brasserie de la Senne and the Brussels Beer Project - adding to an extensive number of established boutique breweries located on the city's outskirts with global demand. Brussels contains also one of the only remaining urban abat-toirs in Europe, dominated by Viangro²⁶ whom produce both for local and national sales.

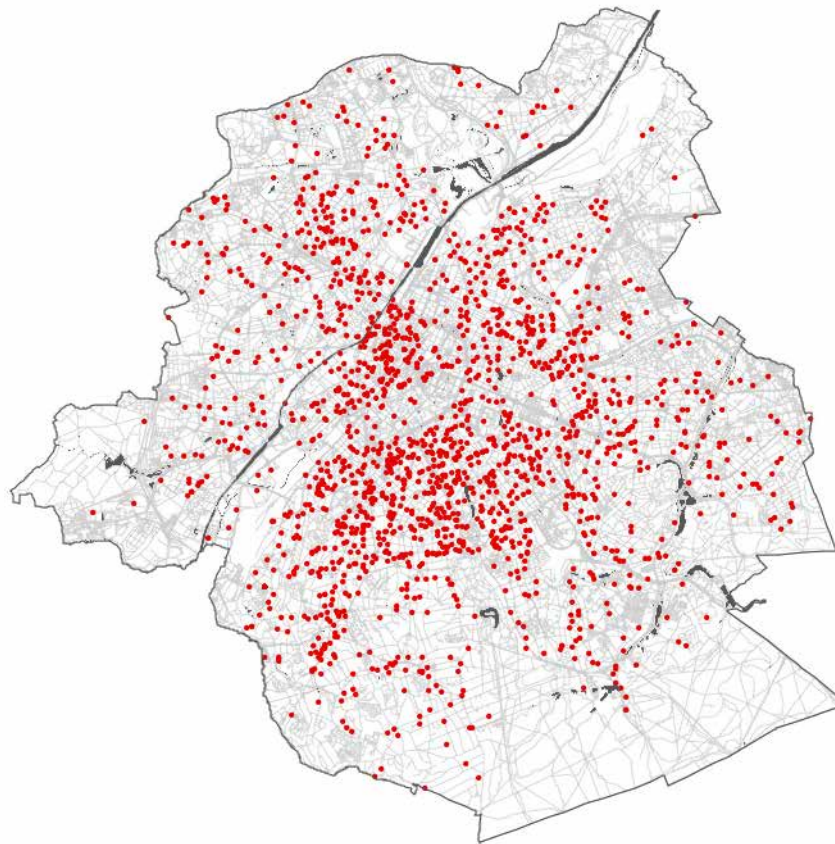
Interesting to note that 95,1% of this sector is occupied by middle and small companies (under 50 workers) with 76,4% of very small companies (<10 workers), especially in the bakery industry²⁷. This begs the question where to draw the line between the industrial scale and the neighbourhood scale of production. Furthermore, 64% of the jobs involve manual work²⁸ indicating that the food sector still requires a skilled labour.

This is one of the only sectors of growth in Belgium but also in Europe²⁹ with the emergence of many new companies founded within the last 10 years. This could be a good sign of development within the sector³⁰ with turnover of the chocolate industry and craft industry growing and investments (public and private) increasing considerably such as regional aid for economic expansion, investments in technical and vocational schools. Despite such growth, Brussels' chocolate-confectionary faces numerous challenges, from the lack of the necessary skills in the local labor market, to mobility, production and distribution issues, to expansion vs relocation.

Innovation plays an important role in terms of packaging, food preservation and transport.

Bio-tech / Pharma / Chemicals

The bio-technology and chemicals sector produces a very diverse range of outputs however the processes and relationships with urban areas could be considered as very similar. Bio-technology and the chemicals industry generally are prime examples of 'triple-helix innovation' - where businesses, research and government agencies are closely aligned. In short, through research funded by public and private financiers (such as Innoviris and Solvay), fundamental and applied research developed by universities and research agencies is then commercialised by businesses. Both biotech and chemical companies may contain an administrative address in the city centre connected to both research and public agencies while



Map5:
Media and Printing
industries

Source:
see Appendix 2

The unassuming
facade of MEC,
producing devices
for the bio-medical
sector
© Adrian Hill



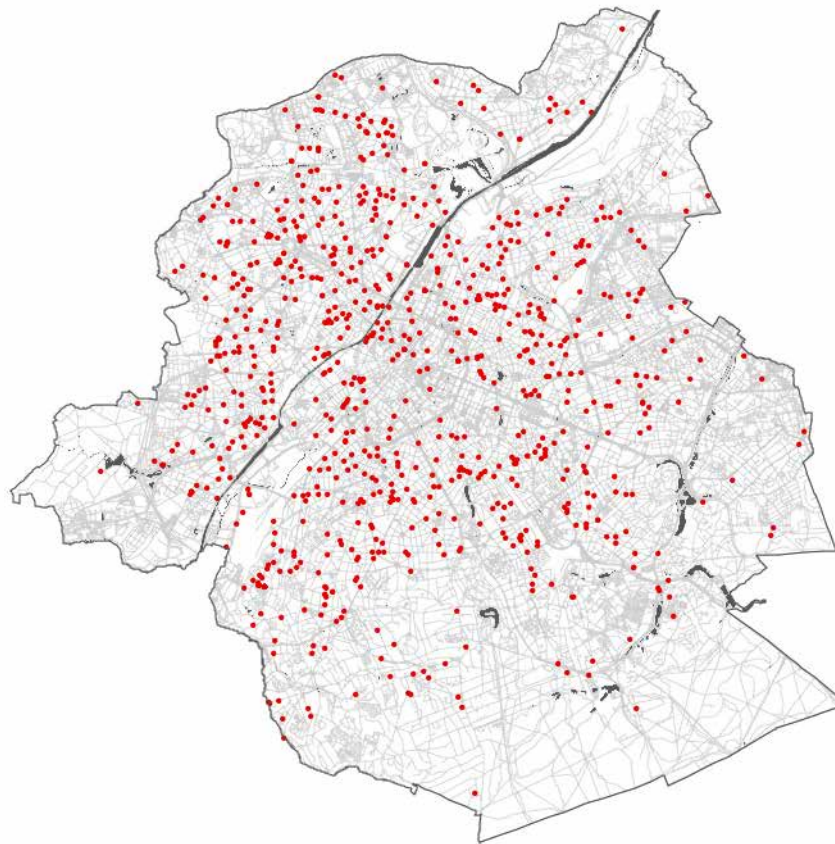
manufacturing their products either closer to the material source (such as a port) or at a safe distance from residential areas. Furthermore, the kind of plant work can involve relatively similar ranges of skills ranging from machine technicians to highly qualified chemists. This sector is represented by a high percentage of women compared to other manufacturing sectors and a lot of high qualified workers³¹. Furthermore, it represents a significant amount of international capital³², which is often

headquartered in the city (even if the manufacturing itself is located elsewhere). Finally, value chains are similar - processing can be focused business to business services (such as producing ammonia for the fertilisers) and therefore unlike a chocolate factory the end result remains an abstract material rather than a tangible product.

In Brussels, both the ULB and VUB have a strong research base and both have research centres connected to university hospitals, headed by some world leading researchers. This is complemented by research from KU Leuven and Université Catholique de Louvain (some 30 kms from Brussels) and connected through trans-university organisations such as the VIB. This begs the question of whether we can categorise this type of manufacturing

as 'urban', particularly if research is done in urban areas while not always the production. However as much of the R+D, sales, communications and management is attached to urban areas we can assume that the urban component cannot be divorced.

There are some notable differences between bio-technology and the chemical sector. There are numerous spin-offs in both cases, such as high-tech instruments developed for hospitals that have little to do with producing fertilisers, however are firmly focused on bio-technology. Likewise the make-up of businesses are different: 79% of pharmaceutical jobs are in big companies (more than 100 workers) whereas the chemical sector has smaller companies (37% of jobs are in companies of less than 50 workers).



Map 6:
Repair Services

Source:
see Appendix 2

Finally, with a large number of hospitals in the region, there is an ecosystem of local manufacturers providing materials and technology which are linked to R+D associated with medical research such as MEC (Medical Engineering and Construction).

Printing

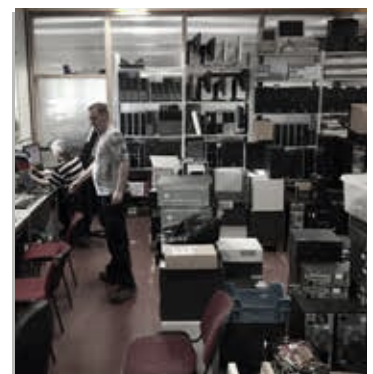
Whether it was due to the region's long history in painting and weaving, or its location as an administrative centre or even due to lax copyright rules that anecdotally allowed for tomes of counterfeits in the 19th century, Brussels has long been an attractive centre for printers.

The printing industry represents a niche with some 3500 employees with an average company size of 15 workers³⁴. Most services are business to business³⁵ and with more effective printing

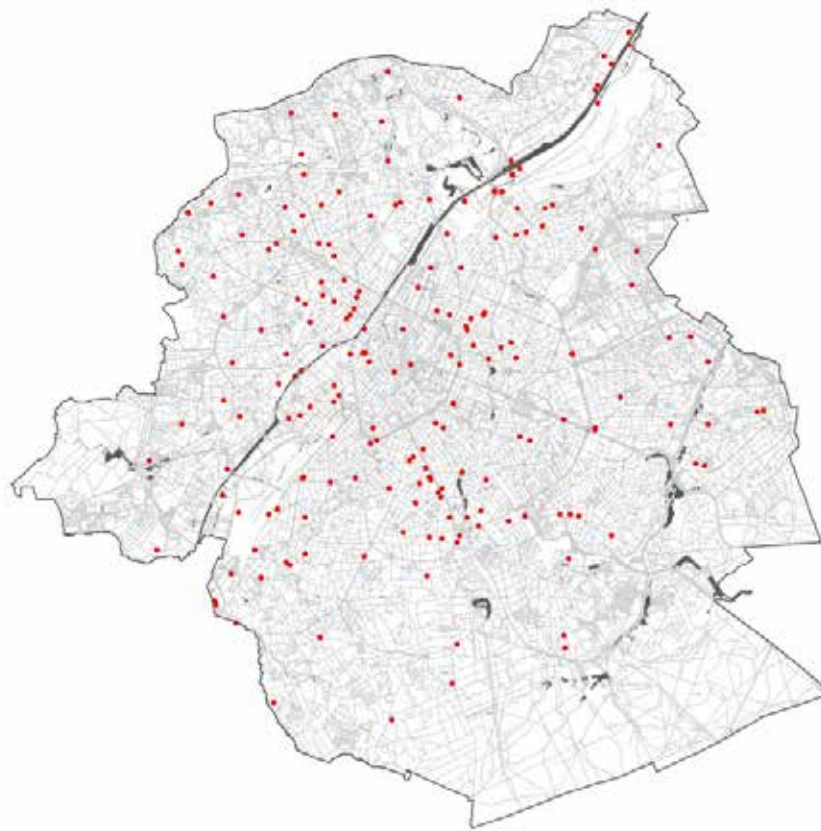
technology far greater volumes can be produced by a smaller number of suppliers. Likewise, delivery costs are allowing printers to be far from their suppliers and remain commercially viable. The consequence is that the printing sector seems not to have a very confident future with many voices suggesting that the sector will decrease over the following years years.

The printing sector may appear banal and not showing healthy signs for a future in urban manufacturing, if not for the arrival of new technologies that are improving accessibility to new products. This includes 3D printers, CNC machines, laser cutting machines and so forth. While fablabs are experimenting with such technology, it is very possible that once a larger customer base is formed, printers will be the likely professional sector that can

provide both private and commercial services. In this sense printing could be at the forefront of an entirely new wave of innovation and we do not see it fading quite yet into the the past. What is questionable is if existing printers are capable of capitalising on this new technology or if a new wave of entrepreneurs will enter the market.



C2FD's workshop
space at RecyK,
a prime example
of linking social
economy and repair.
© Adrian Hill



Map 7:
Recycling services

Source:
see Appendix 2

SUPPORTING SERVICES

There are a number of sectors that do not focus specifically on manufacturing however are critical for it to function effectively and therefore we have included them here as supporting services.

Repair

The difference between manufacturing and repair can come down to semantics. While repairing is endemic to most urban environments, the last half century has produced vast amounts of almost unrepairable goods. Within the context of the circular economy we should be avoiding where possible the full replacement of machines while fixing parts that are no longer functional. Take for example the public transport operator STIB / MIVB, pieces of buses and trams are

constantly being replaced and upgraded without the need to replace the entire vehicle. Repair is thus a critical 'supporting service' that must be associated with 21st century urban manufacturing. There are jobs and skills to be developed within the repair industry that are completely complementary with manufacturing. Furthermore, the environments needed for repair are almost identical to those for manufacturing - such as a workshop or a warehouse.

Since the Employment-Environment Alliance (2010) and the Regional Circular Economy Plan in (2016), repair and new business models associated with services have been promoted at a regional level. New business have emerged since such as CF2D which is a social enterprise rehabilitating office equipment and fit into the circular economy narrative.

Brussels is known for the wide network of second-hand car dealers and car repair garages exporting cars largely to West Africa since the mid-70s. In Anderlecht, the Heyvaert neighbourhood is a cluster of dealerships consisting of more than 150 mostly family-owned garages as well as a tight-knit tribe of related businesses. It is a hub of economic activity, what initially started as a purely import-export-centered cluster of businesses has today evolved into something more akin to an ecosystem including repair, maintenance, painting, welding, electronics, material supply and a raft of supporting businesses, cafes and mosques and churches. Heyvaert neighbourhood is famous for its informal jobs that have allowed low skilled immigrant residents to find work. The peak of 500 cars

The TIR Site, an important logistics hub for the city which will soon be combined with circular economy initiatives
© Adrian Hill



exported daily through to the port of Antwerp has well passed. Business owners' reaction to these plans have been treated with both reluctance and opportunity. The question here is if other forms of repair could replace the cluster of car dealerships.

Recycling

Like repair, recycling is not the most obvious form of urban manufacturing. However within the paradigm of urban metabolism and the circular economy, the re-valuing of material is a critical step in avoiding waste. This in fact is about manufacturing materials however the end result is not a viable product.

In a certain way, Brussels has recycling at its DNA, hosting one of the longest running daily flea markets in the centre of the city at Place Jeu de Bal.

The issue of efficient waste collection, recycling and preparation for reuse is central in the current debate in the region. The current commitment to waste management is the limitation of the quantity of waste through prevention, reuse and recycling. This will be based on a European legislative context.

Waste management is a clear ecological problem, but it also increasingly represents a potential economic resource whose valorisation can bring significant benefits, in particular in terms of job creation. In addition to traditional industrial sectors, social economy enterprises have a societal aim, often including re-employment or reparation projects promoting the social and occupational integration of low skilled or unskilled labour.

Recycling requires the separation of the various

components, from the time of collection, in order to serve as new resources. A few questions could be considered. What actual recycling should occur in Brussels? Rather than just collecting material and exporting it for recycling elsewhere, what should be processed here? Secondly, how can recycling services be commercialised or operationalised? Unless there is a clear business or funding case, it is clear that recycling will not change.

Furthermore, a serious challenge is integrating recycling facilities into urban space. There are a number of collection points across the city yet sorting is limited to five waste streams. Waste transportation, noise, air and visual pollution, are pressing issues that limit the capacity for urban areas to capture and sort waste resources.

Logistics

A large number of businesses complain accessibility and goods transportation is a major challenge. The logistics sector may not produce much however it is a key facilitation service which manufacturers depend on.

Brussels is one of Europe's most congested cities and the widespread use of vans by the logistics sector inside central neighborhoods accounts for. In general, logistics and freight transport companies are more established in the urban periphery, with cheaper land and easier links to highways. Researchers and institutional experts forecast growth in logistics in the region over the next few years - which could also account for possible employment adding to some 30,000 within Brussels alone.

Logistics is one of the sectors providing an opportunity for growth in low skilled jobs and the regional government has made it one of its priorities in the Strategy 2025 and the Strategic Plan for the Transport of Goods. Furthermore, players such as the Port of Brussels are trying to promote sustainable modes of transport, such as the transport of goods via the canal, and to develop innovative transport infrastructures.

Construction material / material recycling sector

Including the construction sector in this list may raise a few eyebrows, however it is undeniable that a city is a never-end factory of real-estate and this form of manufacturing is core business for cities. Furthermore, the construction sector includes technical skills that could be transferable to other sectors (such as vehicles or repairs) and it is very difficult to distinguish the manufacturing component from the more artisanal construction process. Likewise, physical spaces for working (such as workshops)

are quite similar in form to those in manufacturing other things like food or machines. Finally, buildings are vast sinks of materials and energy, making them an obvious target for innovation. In 2014, 628.000 tons of waste was produced by the construction sector, 38% of the total waste in Brussels³⁶, and its energy consumption was about 150.000 GWh PCI³⁷. Businesses are constantly looking for innovative solutions to these kinds of local problems which has been motivated by the Region's focus on the circular economy.

The sector employs a workforce of 33000, eclipsing the sum of all other manufacturing sectors, and has created many new jobs in the past years (3000 between 2008 and 2014)³⁸. Over 40% of construction workers come from Brussels⁴¹, while 93% or more than 1500 companies contain less than 20 workers⁴². On the low side, construction is characterised by a high level of sub-contracting, informal work, flexible jobs⁴³ and involve a very small percentage of women (11% in 2015 for the capital⁴⁴). Over the last years, Brussels' construction sector has seen frequent difficulties in finding skilled workers while there is a noticeable increase in freelance work showing that labour and job security are becoming a challenge for this sector⁴⁵.

Construction takes up relatively little space considering the high level activity³⁹ since much of the activity occurs on building sites. The average surface/worker is quite low comparing to other industrial sectors⁴⁰.

Both recycling and the raw materials for construction are located around the northern and southern canal areas. Cement for example is a material that through European regulation cannot be delivered more than 90 minutes away from its place of production and therefore one company,

Inter-Beton (Heidelberg Cement), has gone to great measures to integrate their cement plant into the urban fabric to avoid dust and noise. The Port of Brussels is also finding its niche by attracting large material recyclers, such as Stevens, who live opposite Inter-Beton, who play a role in the construction material life-cycle.

At a smaller end, smaller businesses requiring workshops are finding it harder and harder to find or afford reasonable space and therefore many cabinet makers, plumbers, electricians (and so on) live in the outskirts. The region's developer, Citydev, is in the process of creating affordable smaller 100-1000 spaces m² however the demand truly outstrips supply.

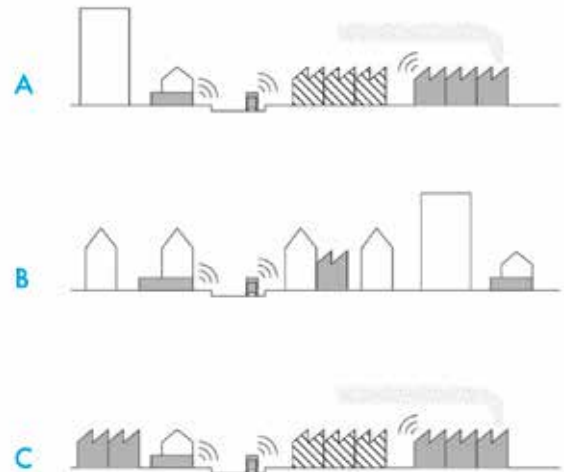


View over Heyvaert,
famed for its
second-hand car
market.
© Diogo Pires

THE GEOGRAPHY OF BRUSSELS' MAKING

The current geography of Brussels' manufacturing is the result of an historical distribution of productive spaces that follows a precise infrastructure, socio-spatial and economic/business logic. Recent global economic trends as well as regional competitiveness and local policies and subsidies have largely influenced the appearance, disappearance and displacement of many activities. The Canal⁴⁶ has structured Brussels' productive space cutting the city in half, with the main route linking the city to the economic hub of Antwerp and to the North Sea. This has had a dramatic influence in the city's urban, productive and industrial development. The result is essentially three typologies: A) manufacturing blocks adjoining other land uses B) highly mixed zones and C) industrial zones (see image right).

A section of three typical urban typologies for manufacturing in Brussels.
© Latitude



A) pockets of manufacturing adjoining other land uses

While it is easy to fall into the trap of thinking the canal precinct is the main focus of industrial activity, much of Brussels' 'heavier' manufacturing is located in areas of great 'horizontal mix'. Industry is built next to a sports field which is surrounded by housing, for example. Two of the city's largest industrial employers, Audi in the south and SABCA in the North, are located in industrial areas separated from residential areas by merely a road. The areas include Cureghem and Forest. These zones are neither at risk or entirely safe from redevelopment. The contentious ZEMU projects (see below) are finding their place on such sites.

B) highly mixed zones

The most particularly interesting and organically grown manufacturing is found in the 19th century neighbourhoods, outside of the medieval city walls, where over time industry and housing built up a delicate ecosystem together. Neighbourhoods including Heyvaert, Molenbeek and Masui are some of the city's peculiarities, located minutes away from the city centre yet containing an incredibly rich mix of housing, schools, garages, small factories, playgrounds, market spaces for informal dealings and some remarkable examples of early 20th century art nouveau architecture. These are the arrival neighbourhoods for new poor migrants, providing access to low-barrier work (often informal with little need for language

skills) which allows them to find their place in the city. These are areas where things are fixed and adapted as both technical knowledge and cheap labour is in supply. However it is also the area under the gaze of developers seeking to transform the charming industrial space into housing opportunities - propelled in part by public authorities supporting 'beautification programmes' - see description of the PADs, CRUs and Neighbourhood Contracts below.

C) Industrial zones

Following the widening of the canal zone as sea harbour (early 20th century) led to the creation of three main docks (Gobert, Béco, Vergote) and large industrial complexes (i.e. Tour & Taxis) and warehouses, developing larger industrial areas in the northern and southern parts of the axis where new sectors implanted (chemical, petrochemical, construction, gas). Due to the deindustrialisation process since the 1960's along the Canal area, logistics have gradually replaced industry. Irrespective a number of larger manufacturers remaining particularly in zones at the north (Buda) and the south (Paepsem). This zone now performs some of the most basic metabolic work for the city: bringing in sand and building material, processing wastewater and recycling building material such as steel. The biggest question is about dealing with noise and dust issues - the Interbeton (Heidelberg) cement factory on the dock edge adjoining one of the city's newest and largest housing towers was forced to adapt its design to manage noise and dust.



Ninove

Chaussée de

Château

RAFFINERIE DE SUCRE
E. F. GRÄFFE ET C^{ie}

SOCIÉTÉ ANON^{me} LA PLAQUERIE BELGE
F. HAGEMeyer AG^t DELEGUE

LA PANIFICATION
A. VAN DEN HOVE & C^{ie}

JOSEPH LEGRAND
CONSTRUCTEUR MÉCANICIEN

STAMP DES ATELIERS DE CONSTRUCTION
H. BOLLINCKX

Abattoirs

Cureghem

FABR^{ic} D'HUILES & GRAISSES INDUSTRIELLES
RAFFINERIE DE PÉTROLE
ETABLISSEMENTS FERD. DEMETS

MAN^{re} ROYALE DES BOUGIES DE LA COUR
MAGASIN EXPÉDITION

MAN^{re} ROYALE DES BOUGIES DE LA COUR
STÉARINERIE, ETC.

MANUFACTURE DE CHAUSSEURS
JULES ST

FAB^{ric} DE TOILES CIRÉES & LINDLEUM
ETABL^{is} G. MOREAU & C^{ie} SOC^{ts} AN^{ns}

MANUF^{act} GÉN^{er} D'INSTRUMENTS DE MUSIQUE
MAHILLON & C^{ie}

CHARENTES DE FER
CONSTRUCTIONS MÉTALLIQUES
V. BERTAUX & C^{ie}

CONSTRUCTIONS MÉTALLIQUES
GALVANISATION, FORGES
V. BERTAUX & C^{ie}

FABR^{ic} DE BOUGIES, STÉARINERIE, ETC
ETABL^{is} BOLLINCKX SOC^{ts} AN^{ns}

ANDERLECHT

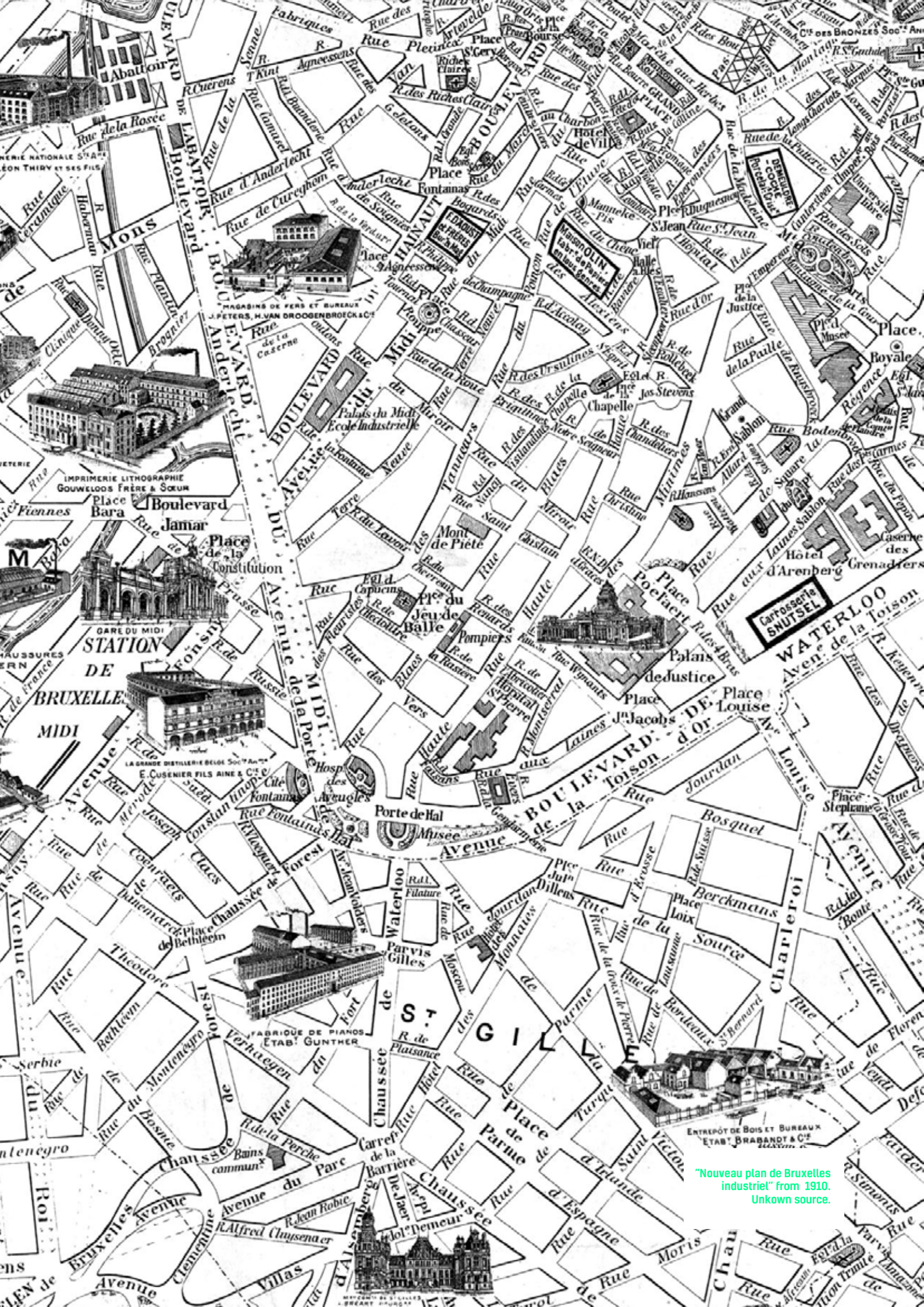
Gaz de
St Gilles

ENTREPRISE GÉNÉRALE DE TRAVAUX EN ASPHALTE
EMMANUEL TROJAN

MAGASINS DE POUTRELLES (RACCORDS GRAY DU MIDY)
J. PETERS, H. VAN DROOGENBROECK & C^{ie}

VUE GÉNÉRALE DE LA BRASSERIE
WIELEMANS-CEUPPENS

Avenue Wielemans-Ceuppens



"Nouveau plan de Bruxelles industriel" from 1910.
Unknown source.

2.3 Governance and Decision Making in Brussels

While a modest city by world standards, Brussels is a complex stew of political interests from local to continental. This complexity can either render it motionless or result in innovative governance and strategic development approaches, with a recent focus on developing greater intergration of productive and manufacturing spaces.

The following section helps explain some of the complexity of decision making and power relations at a regional level.

To grasp public decision making in Brussels, the complex Belgian political system must be described. Since Belgium's independence in 1830, and after five state reforms, the country evolved into a federal structure⁴⁷. "The power to make decisions is no longer the exclusive preserve of the federal government and the federal parliament. The leadership of the country is now in the hands of various partners [the regions], who independently exercise their authority within their domains."⁴⁸

Belgian politics is not pyramidal in structure and sometimes quite the contrary leading to a complex governance system where competences in several cases are not univocal. The Federal State retains important powers in the area of foreign affairs, national defence, justice, finance, social security, parts of national health and domestic affairs. However, the communities and the regions also have the power to establish and maintain foreign

relations to ensure decision processes are closer to the citizens and their quality of life. In this way, the mayor of one city can be the most important person in Belgian politics while another could almost single-handedly halt a trans-Pacific trade deal.

The regions, which historically aspired for more economic autonomy, conveyed economic interests, resulting in the establishment of three regions: the Flemish Region, the Brussels Capital Region and the Walloon Region. Up to a certain point they can be compared with the American states or the German 'Länder'. The country is then further divided into 10 provinces and 589 municipal councils - each with different economic policies and priorities.

Since the redistribution of power occurred along two lines, language and culture, the reform led to the creation of 'communities': referring to persons that are unified by their language (Dutch, French and German) and culture. As a result, Belgium today has three communities: the Flemish Community, the French

The canal precinct, near Biestebroek, one of the Region's largest new mixed urban areas (ZEMU) involving a large range of regional actors.
©Diogo Pirez



Community and the German-speaking Community that correspond to population groups⁴⁹. To simplify, French terms and official titles will be used from here-on.

BRUSSELS CAPITAL REGION

The regional boundaries has rendered Brussels a 160 km² city state, with various political parties sharing power from various language groups. The Brussels Capital Region (the Region from here-on) is the decision making structure concerning most manufacturing and territorial issues. Manufacturing related issues can fall under four or five different ministers (employment, environment, economic affairs, public works, mobility and so forth), with each politician carrying a very different nuance on the relevance of productive industry. In practice the complexity of this governance structure means that the agencies responsible for

executing political mandates have a large responsibility in translating governance into action and in this way hold a certain level of power in simply getting things done. What connects the regional agencies and organisations are the plans including sustainable development, circular economy and local development plans.

Actors

The BDU - Brussels Urban Development agency aims at managing the development of the regional territory while “meeting the basic social, economic and environmental needs of the population” and it is responsible for specific activities in close collaboration with a series of directorates dealing with planning (development and zoning plans), urban development (regional and communal building permits) housing (renovation and improvement subsidies), urban renewal (urban and landscape revitalisa-

tion programmes) and heritage. Within the Brussels Urban Development agency, the Directorate of Urbanism aims at ensuring the proper application of the regional planning regulations, including land parcelling permission and environmental impact reports, keeping informed the public bodies and the general public.

The Region's territorial development is coordinated by the Direction Etudes et Planification (DEP) which monitors strategic planning (Plan Régional de Développement, Communal Development Plan and blueprints) and regulatory planning (Plan Régional d'Affectation du Sol [PRAS] and Private Designated Land Use Plans) and their implementation. It runs the permanent secretariat of the Commission Régionale de Développement (CRD) and represents the Brussels Urban Development agency at the supra-regional and European level.

Furthermore, a range of other public organisations and agencies have some connection to urban manufacturing. Perspective is the Region's centre for territorial expertise and development. The Brussels Region Architect (BMA) is connected to Perspective and helps improve the quality of both private and public urban design and architectural projects - most recently also supporting co-design of mixed use projects. Bruxelles Environnement is the region's environmental protection agency, handling a range of issues including soil quality, pollution and the region's Circular Economy Plan (PREC). Actiris is the Region's employment agency dealing with the demand and offer of the Region's labour force and training. Hub.brussels is a newly created agency focusing on supporting businesses. Innoviris is the region's research and innovation agency who have a particular interest in technology and artificial intelligence. The Port of Brussels is a relatively autonomous public organisation that manages some 105 hectares and 5.5 kms of quays and port side land. Brussels Mobilité oversees all forms of mobility including logistics. The Société

d'Aménagement Urbain (SAU) is responsible for larger development zones, particularly in the mixed and industrial areas along the canal. Citydev is the regional developer for housing, social and industrial buildings whom are pioneering the development of mixed use projects. Bruxelles Economie et Emploi provide financial support local manufacturers through the 'Small Business Act' while offering a link to the EU market. Each of these agencies and organisations is presided over by a politician and therefore each often executes the political persuasion of that politician or political party. Refer to the actor mapping, page 56.

Plans

There are a range of plans that affect or contribute to the urban manufacturing landscape. From a territorial perspective the PRAS, the regional land use plan, sets the clearest guidelines for where functions occur. Plans can range from the strategic (such as the PRDD) to operational (such as an area plan).

Within the framework of the Regional Sustainable Development Plan (PRDD), the Brussels-Capital Region envisages the establishment of large projects regarding various development focal points. "Large urban renewal projects have been launched to improve the attractiveness of the Region and provide an environment that meets the evolving needs of the inhabitants of Brussels who want to live, work and spend their free time in pleasant surroundings. The main challenges facing the authorities are the need to reduce social and territorial inequalities, strengthen social cohesion through the construction of housing and infrastructure, improve mobility and highlight the Region's international assets".

In 2016, a world pioneering Regional Circular Economy Plan (PREC) was developed, an initiative of three ministers and executed by 13 regional agencies (including Bruxelles Environnement, Perspective and Citydev). While not stipulated directly,

urban manufacturing could play a clear role. More recently, a Regional Industrial Plan was launched to define a trajectory for industry and is planned for release in September 2018. This plan will focus on the strategic future role of industry in the city.

More concretely there are numerous urban development planning approaches which may impact urban manufacturing. The Plan d'Aménagement Directeur (PAD) is a planning tool to create a regulatory and operational masterplan in sensitive neighbourhoods that are under the likelihood of rapid change - existing PADs are being developed in two highly mixed areas with manufacturing: Heyvaert and Masui. The Contrats de Renovation Urbain (CRU) involve strategic interventions for development such as a park, school or neighbourhood centre. The 'Neighbourhood Contracts' (Contrats de quartier) provide financing for neighbourhoods to improve the social and environmental quality of deprived inner-city neighbourhoods. These plans in practice can work for manufacturers (through creating new facilities) or against manufacturers by appropriating land and pushing up land prices.

IN PRACTICE

Frequent changes in the panorama of Brussels' decision making structure noted above renders a serious challenge in understanding the different relations between involved actors and stakeholders. Plans help structure discussions, however much of the execution depends on the capacities and interests of the individuals working for the regional agencies. In order to better understand the most relevant and urgent regional planning and policy issues in the Region, a series of interviews were conducted with the main organisations operating in the field, from which the following key points have been extracted.

Beyond the border

According to most of the interviewees, one of the most peculiar aspects of

Brussels, is the administrative borders of the city-region which is fully surrounded by the Flemish territory making Brussels city-region within a region. Rarely does Brussels, Flanders or Wallonia take a metropolitan perspective on a vast range of issues from mobility to logistics, food, education or industry.

As clearly stated by several experts, the city-region is both a disadvantage and an advantage⁴⁹. Moving across the regional borders involves different administrative, language and cultural contexts (Flanders or Wallonia). For what concerns manufacturing in general, the main challenge is competition with other neighbouring cities whom have far greater influence over peri-urban areas that can accommodate productive activities more effectively than Brussels. Therefore, the dialogue with the other Regions is a very strategic issue. In the recent PREC (Regional Circular Economy Plan) for example, it is clearly stated that the Brussels Capital Region must engage in dialogue with the other regions, showing a growing awareness about the need of an inter-regional vision. However, the main problem remains understanding the right ways to collaborate and operate. The lack of consistent vision and the problems of governance in Brussels highlights an introverted tendency of turning into the local context and the controversial ambition of trying to be fully autonomous - in other words producing all that the region needs within the region⁵⁰.

Brussels Public Authorities: a complex machine

The various public agencies, noted above, regularly collaborate yet due to different expertise and bureaucracy, visions can be misinterpreted or poorly delivered. For example, the PREC (Regional Circular Economy Plan), which is driven by Bruxelles Environnement and the Industrial Plan (Minister Gosuin) are disconnected while they concern for the most part the same subject.

Another example of the weakness of



The heart of
manufacturing.
RVB
© Adrian Hill

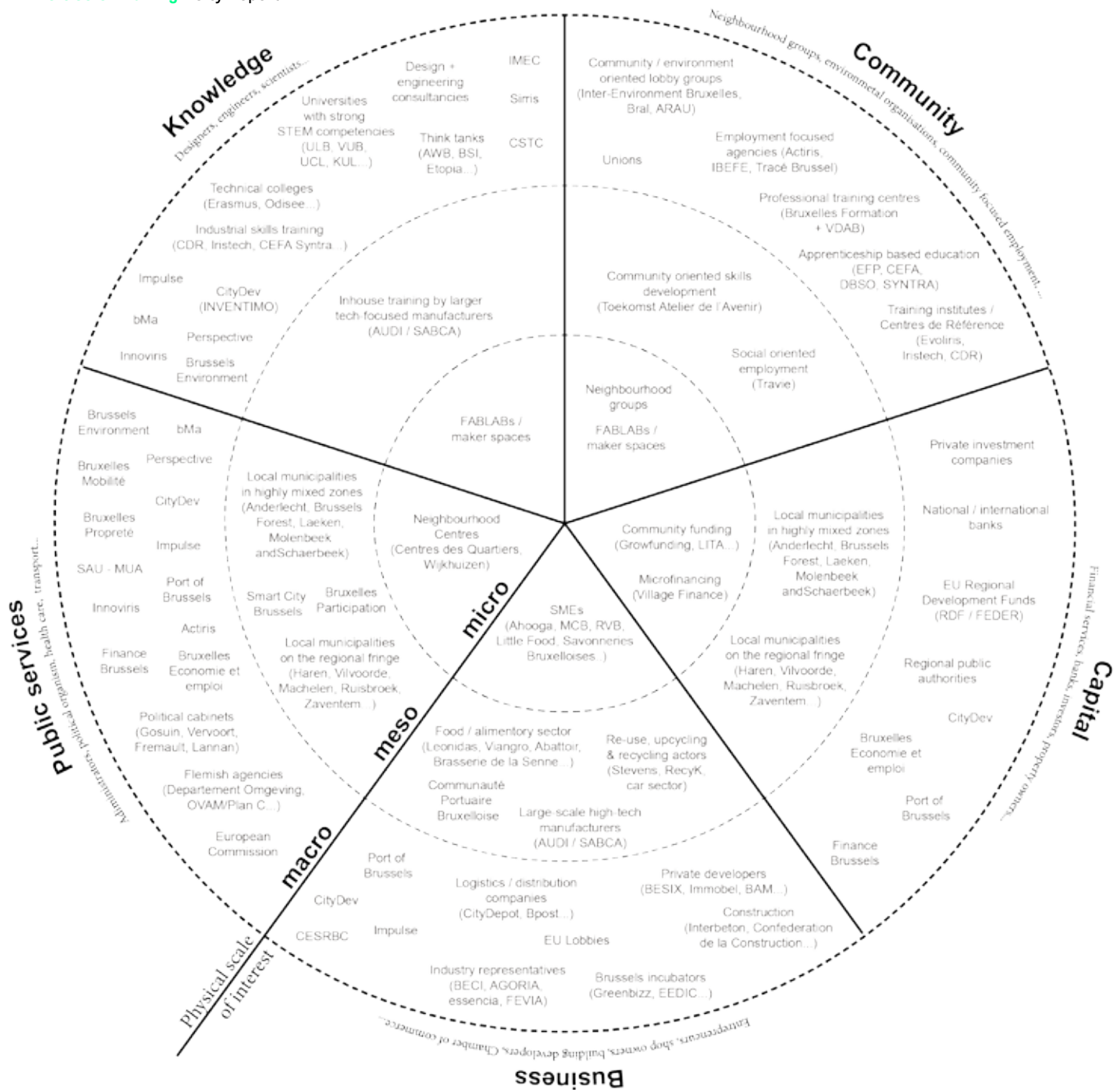


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20	RVB USINAGE MANUEL WARD55	Filletage côté 2 (3/4) Boîte outils N° 279

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Box 1:

Map of significant stakeholders connected to the manufacturing in and around Brussels

The map shows the five 'penta-helix' stakeholder groups associated with place-based development. Public services include both political and administrative

stakeholders. Businesses include individual businesses and business organisations such as a chamber of commerce. Capital includes those stakeholders that own land, technology or finance investment. Knowledge focused stakeholders include researchers and consultants. Community stakeholder involve community based organisations, rather than individuals.

The scales refer to an approximate scale of interest - micro scale refers to a neighbourhood, meso refers to a municipality while the macro involves stakeholders with regional or inter-regional interests. The map itself offers a non-exhaustive list of stakeholders that were identified during interviews. It is completely qualitative and is merely a discussion tool.

What the map shows is how there are numerous regional agencies connected with urban manufacturing, sharing responsibilities for certain aspects of the topic however there is no single actor that has a wholistic view or responsibility. A second interesting outcome is the range of actors connected with training and skills development.

public power are the ZEMUs (Economic Zones in an Urban Context), which will be explained in more detail on page 61. ZEMUs are a special planning tool intended to provide more intensive, mixed use of industrial land. However in practice due to the complexity, a lot of the practical details have been left in the hands of the private sector, that has almost no experience in developing housing projects combined with industrial or productive spaces.

Furthermore, real estate developers have a lot of power compared to public authorities who are unable to oppose certain real-estate pressure. Private developers can recruit highly experienced and qualified staff and are often quite close to public actors helping to adapt ambiguous urban planning in their favour. Consequently activities other than housing driven real estate have a loose footing in the political agenda.

According to various individuals within Perspective (the regional planning agency)⁵³, a big challenge for territorial governance is the lack of an economic perspective and difficulty to build common ground amongst the regional agencies. The consequence of unfounded knowledge is that personal opinion becomes a driving factor in the regional narrative. Some individuals site the importance of a manufacturing base and skilled workers, the need for resilience, while others claim NIMBYism, noise and air pollution, lack of demand and mobility obstacles. This leads to different institutional visions or even fragmented institutional positions. One interview noted that “there is often little opportunity to collaborate and see each other to share a vision of the city”⁵⁴. The economic model for Brussels is not easy to find: its administrative, geographic and governance limits result in a lack of strategic vision and uncertainty about the right model to follow.

Frictions on competences

The complexity of the architecture of Brussels’ institutions reveals a number

of tensions and overlaps. The interviews revealed that recent reorganisations and restructuring have led on the one hand to positive efforts towards efficiency and the willingness to build shared visions, while conversely it seems governance and power issues are still present.

Critical voices claim that since the early 90s, the lack of economic knowledge and specific skills led to dramatic damages. Consequently, it is still possible today to observe differences of economic visions between Perspective and the newly formed Hub.brussels (formerly Impulse). Furthermore differences can be seen between Perspective/BMA and CityDev in terms of investing public money in housing and industrial spaces. While differences in opinion are natural and expected within regional agencies, it can be troubling for manufacturers whom don’t know which public agency to turn to and/or if their interests are being represented by regional policy. In fact various manufacturers and businesses noted that it was unclear who they should turn to for help. Based on an extensive stakeholder analysis (see Box 1), it is clear that no single agency has the competencies or the capacity to deal with a vast range of issues associated with manufacturing including: building permits, environmental permits, financing, mobility, training and skills and so forth.

An additional problem stifling inter-organisational collaborations has to do with a lack of resources to follow joint projects. Impulse, for example, pointed to staff deficit as a serious limitation rather than interest or inter-institutional relations.

Impact of plans and policies on urban manufacturing

Interviews revealed claims that massive real-estate speculation in Brussels⁵⁵, common for other European cities, is well facilitated through legislation and spatial planning. The PRAS (Regional Land Use Plan) gives a lot of de facto power to developers, instead of distributing power between developers and the public

EXISTING



Former industrial site/land in low-mid income mixed area (small manufactures, larger industrial activities, housing)

IMPACT OF CHANGING SOME INDUSTRY TO OTHER LAND USES (IE HOUSING + OFFICES)



1. A change in zoning of industrial land (such as ZEMU) encourages the injection of mixed redevelopments with light industry, higher paying non-industrial functions and housing.



2. Housing and light high-tech industry create friction due to logistics and pollution, putting pressure on existing industrial activities and low-income housing.



3. Uncontrolled gentrification and relocation of existing industry force weaker activities and social groups to move away.

The impact of mixed use developments on other industrial areas.
© Latitude

sector. There is little difference between zoning for administrative functions, offices and industrial-manufacturing activities due to the poor definition of manufacturing. Conversely new forms of manufacturing could occur in offices or on municipal land surrounded by residential areas.

More specifically, some regional development programmes may come across as supporting manufacturing, but actually work against it. The ZEMU zoning, puts the onus on private developers to integrate productive spaces into their residential focused projects. The neighbourhood contracts (Contrats de quartier) invest millions of Euros in the 'renewing' neglected and poor inner-city neighbourhoods, which can result in increased land value, gentrification and squeezing out manufacturing type tenants. Even designers developing urban masterplans (ie PADs)

struggle to resist concentrating on seductive public space and housing projects while neglecting the business networks that are sustaining the neighbourhoods.

Furthermore the Region's sustainable development plan (the PRDD) confirms the tendency of the city to focus mainly on the tertiary sector (creation of offices, congress center, head offices, ...). Only a small part of the plan is devoted to the local economy and support for urban production (ZEMU, ZEUS, ...). Proposed new training centers are dedicated to digital, media, communication, logistics and catering. While certainly some neighbourhoods are characterised by their shabby industrial character and do not provide a pleasant living environment, the impact of the PRDD and ZEMU could push issues to another extreme whereby there is no protection for existing manufacturers while

all building real estate owners focus on the burgeoning housing market.

Mixed development zones (ZEMU): a troublesome strategy

Industrial areas have been decommissioned regularly since the 1960's, reducing industrial land to a mere 3.8% of the region's surface (some 500 hectares). Furthermore, the last half century of land use planning has resulted in very inefficient use of space through forced setbacks, easements and parking⁵⁶. The ZEMU zones are thus an enterprising solution enacted by the Region to offer more effective use of available land while and take advantage of the vertical space for other functions such as housing, community functions and even open space. The ZEMU regulation increases the variety of accepted activities, including shops, public services and housing while limiting maximum building footprints and size of lots across six ZEMU in Brussels. While vertical mix is a very sensible idea, in practice it could be troubling for the future of industrial space, with the following points raised in the interviews.

The planning regulation is innovative for Brussels, which allows for more intensive use on the land-poor region, in practice there are no delivered test cases in Brussels or known reliable precedents in Europe to learn about challenges involved in both the development process and the long-term use of such mixed use sites. By the time the first ZEMU projects are being rolled out (somewhere around 2021-2023), there will be hectares of other new projects in the pipeline making it hard to change policy.

ZEMU sites are being built by developers who essentially have a short-term interest in the sites while the developers interested in such projects are generally specialised in housing and commercial real-estate, with no experience in industrial sites. This means that their priority is to build and sell in the shortest period of time and are generally not interested in

who occupies the industrial spaces over the long-term. Developers have indicated that the industrial spaces are the price to pay for the opportunity to access the real money maker - housing.

ZEMU is troublesome for future users of the industrial spaces. With residential neighbours, noise, dust and large trucks may be seriously limited in the type of work and working hours. Furthermore, the sites may be far too expensive for manufacturers as developers benchmark commercial or retail space in their spreadsheets rather than the much cheaper industrial land.

Finally the spaces may not suit the buying capacity of local manufacturers - offered only for sale and not for rent (rental being favoured particularly by risk averse smaller and younger businesses).

According to the BMA⁵⁷ the tool remains effective to counter land prices yet requires a more coherent development process and support to connect businesses and available space. However several institutional and private actors have criticised the ZEMU zones in their current legal form⁵⁸. Real estate pressure for residential development, allowed in this type of area, has been recognised to be at the source of both industrial and social gentrification processes.

First studies on the topics seem to confirm this observation⁵⁹. Institutional actors are frequently questioning the lack of an adapted policy framework such as rent control instruments, citing a need for a review of the ZEMU requirements. Even real estate developers are complaining because of the obligation for big residential projects to integrate less valuable productive activities that they would avoid if they could. Others, such as the VUB's Sarah De Broeck⁶⁰, have postulated that such sites will eventually be too expensive for productive activities and it is just slowing the transition from industrial to residential focused areas.

2.4 Ongoing projects and Activity

Brussels has been experimenting with the development of productive spaces across a number of scales. This ranges from the design of buildings to the planning of new neighbourhoods based on mixed use that combine makers, thinkers, spaces for education, leisure and living. Other initiatives are looking at building better ecosystems between manufacturers in industrial areas in inter-regional sites.

GREENBIZZ

Developed by Citydev, funded by European Regional Development Funds (ERDF) and inaugurated in 2016, Greenbizz is a business center for entrepreneurial projects focused on sustainability, social and circular economy. The project draws together a range of regional actors, including Citydev, Bruxelles Environnement, Impulse (now Hub.brussels), Innoviris and the Scientific and Technical Centre for Construction (CSTC). The main goal is to support innovative and “green” economic activities, which links to a range of regional initiatives such as the regional circular economy plan (the PREC) and Impulse’s support for Greentech business start-ups, while creating a socio-economic ecosystem where Brussels focused companies with similar interests and connected activities can collaborate under the same roof.

The low energy building consists of

some 16,000m² workshop and office space while housing the region’s first public fablab that was inaugurated in early 2018⁶¹ (Cityfab 1). The modular workshop spaces range from 150-500 m² (said to be in greatest demand) at competitive prices, while the offices spaces include both private offices and flex-desks. Furthermore there are a range of meeting rooms, event spaces and common spaces, intended to not only bring together making and thinking type businesses, but also to attract businesses that need both making and thinking spaces. The fact that spaces are modular and flexible means that businesses are able to grow and adapt or join forces with businesses next door.

An example of such a project involves a start-up developing greenhouses from recovered materials called the ‘Tomato Chili Project’. The collaboration of a builder, a designer and a number of other

Biestebroek ZEMU
masterplan
© BUUR



businesses located in the Greenbizz building resulted in greenhouses built from material salvaged from construction sites in Brussels, involving on-site construction training for unemployed job seekers. While the net result is modest, it shows the power of housing these actors together.

Greenbizz hosts some 30 companies including ecological design, construction, food processing, smart technologies and ICT services. The environmental commitment of the businesses is not always very clear and has raised some criticism of greenwashing⁶². In practice, compromises are impossible to avoid, between finding the appropriate businesses and filling the available space. However it raises alarm bells regarding future long-term management of ZEMU development areas where simply building space will not guarantee the appropriate actors will occupy the spaces. Secondly, while Greenbizz

provides a great habitat for start-ups and young businesses, the ERDF financing provided a unique space that may not be easily replicated across the city. Therefore, highly subsidised spaces such as this could offer a short-term incubation space for businesses to grow. Yet there is no regional strategy to help businesses shift from spaces such as Greenbizz to longer-term spaces (rented or purchase) that are available on the private market such as those being developed within the ZEMU zones.

BIESTEBROEK

Biestebroek is a 30 hectare ZEMU site, at the southern end of the canal, which is in the throws of redevelopment. The plan for the area involves a mix of housing, businesses, two schools, public waterfront space, community facilities, a regional logistics point for water based freight, a private marina in addition to the standard



industrial functions required to qualify for ZEMU accounting for some 460,000m² of development. The public space fronting the canal will be combined with the redevelopment of the port activity around the dock for the an Urban Transshipment Centre (CTU) by the Port of Brussels and the intensification of a building materials company Gobert. Biestebroek is relatively central but located in an unknown corner of Brussels, sandwiched between a rail line, a busy arterial road and the canal, while it is located next to one of the region's poorest neighbourhoods.

Much of the land is in the hands of some of the region's largest developers, making this one of the city's largest mixed-use urban developments. It raises a vast range of questions that will only reveal themselves over the coming decade when the buildings are complete and the neighbourhood becomes active. With high expectations for the project area, it could become a popular destination along

the canal. This begs the question, what kinds of businesses would move into such industrial spaces? Will the land value be controlled or will it be subject to speculation in tandem with the value of the residential apartments? Likewise, if the site becomes attractive, will residents put pressure on pushing out any loud businesses that will use the industrial spaces on the ground floors? Who will eventually own the industrial spaces?

Despite extensive uncertainties, the region has a novel planning approach for dealing with mixed use development, focused along the canal zone (a 1 km zone offset either side of the canal). Projects developed in the canal zone are facilitated through the canal team, representing a number of key regional institutions, the local municipality and the Brussels Region Architect (BMA). Project developers must commit to some 4-5 'research by design' meetings during the project conception process. This means that the canal team



Greenbizz's productive groundfloor. The office spaces are located above.
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can keep a coherent overview of active projects, curating the contents and urban design, while not being shocked by when a project when it is submitted for development consent. Currently one weakness is that there is no facilitator that has an overview of the spaces being created for manufacturing type businesses, the available stock of space in the pipeline and the businesses interested in the available spaces.

BUDA⁶³

The 'Buda' zone ⁶⁷ is known for the former Renault Vilvoorde factory at the north of the Region. It is a well established industrial zone supporting a range of productive activities, waste management, water treatment and services such as logistics. The area is strategically located near Brussels and the airport and is accessible via road, rail and water - playing an important economic role on a regional and national scale. Nevertheless, the zone is currently facing a number of challenges particularly since it is located on the fringe of two regions whom have neglected investing in transversal spatial policy. This neglect has recently allowed an ambitious developer to propose one of the largest shopping centres in the region (called Uplace) on a site just outside of the Brussels' boundary.

Since 2017, a territorial development program (T.OP) in the Noordrand has been established, in addition to a partnership called Buda+, bringing together for the first time actors from both Flanders (the region of Flemish Brabant, local municipalities, the Flemish planning agency and the Flemish resource agency) and Brussels (Perspective and the municipality of Brussels). This kind of alliance is novel as a metropolitan perspective for Brussels, Flanders and Wallonia.

One of the leverage points for this inter-regional dialogue was the 2016 International Architecture Biennale under the theme of the 'productive city', that focused on the Buda zone. This meant the Flemish and Brussels region were mediated through a third actor who's concerns were largely a-political and pragmatic. Since then numerous publicly funded and university based research projects have shown potential for the site.

More recently a shared spatial vision is being developed, including a concrete action program to coordinate various initiatives in the area. Consequently there are a series of projects and interrelated initiatives in the pipeline. One such project is to formalise an industrial symbiosis network to increase value of waste streams generated in the Buda itself and Brussels.

Diversity in the Buda district: a regional fuel storage depot, flanked by an ecological pool builder and a large retail hardware shop.
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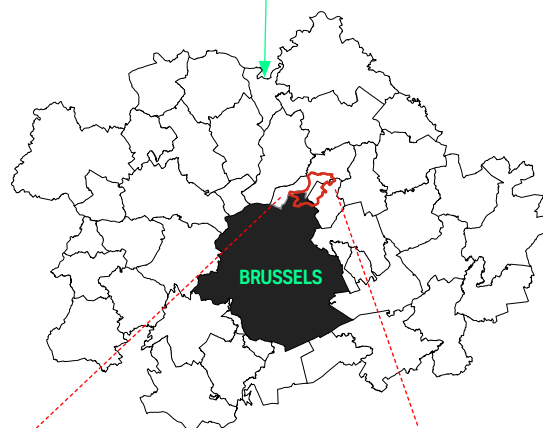


DOMINANT ECONOMIC USE MAP OF BUSINESSES IN AND AROUND BUDA.

Map shows the diversity of sectors and business types in the Buda area.



MUNICIPALITIES OF
FLEMISH BRABANT



Departement Omgeving, Provincie
Vlaams-Brabant, OVAM, perspective.brussels, Giaretta F.,
Architecture Workroom Brussels. (2018) Dominant economic
use map of the wider Brussels area. Not published internal
document.



2.5 Making at the heart of Brussels

Despite recent efforts by regional authorities to integrate productive spaces into new development projects in established industrial neighbourhoods, much work is to be done in better understanding how manufacturing can be integrated into the 21st century urban economy. Basic questions, such as what types of making are wanted, may need to come before thinking about where to put it. Underlining this is the question of skills gaps and linking thinkers and makers.

1. GIVING URBAN MANUFACTURING A NAME

One of the biggest challenges for urban manufacturing is to define what it means. Currently a vast range of activities fall into an ‘industrial’ category which can include - transportation, waste management, storage, agriculture, repairs, retail, offices, even film production, in addition to core manufacturing activities such as production of car parts or processing food. This makes it hard to understand what value urban manufacturing provides for the city and why the region should support it. Furthermore it makes it difficult for regional planners to target the needs of specific user-groups, such as manufacturers.

Defining Urban Manufacturing in Brussels

Interviews with regional actors and stakeholders during the analysis began

with an open question - what is urban manufacturing? It is clear that there is no regional definition for manufacturing or what it means for Brussels.

As noted earlier, the translation of the word urban manufacturing into French and Dutch is not entirely the same. The words “good” and “transformation” were present in most conversations or “the production of goods by transformation” as noted by Amynah Gangji from Brussels Institute of Statistics. However there were many questions surrounding supporting services such as design, logistics, repair, recycling administration and so forth. Respondents saw it necessary to differentiate material and immaterial goods - for example the production of software and even water is classified as immaterial goods, a baker can be considered commerce, workshops and storage can fall under office spaces.

Some interviewees also struggled with

distinguishing scale differences between crafts, manufacturing and industry. The difference between industry and manufacturing is not so obvious yet industry is generally considered a broader topic. A case in point, the authors of the Industrial Plan, found it possible to include the audio-visual industry into their definition as they saw it is more linked to contemporary production focused on digital rather than physical material.

The Brussels Region Architect Kristiaan Borret, presented another position, associating urban manufacturing with the concept of a productive city, boiling it down to three areas: firstly more traditional ones such as repair and construction (car repairs, plumbers, electricians) that are not producing goods but are working with materials; secondly fashionable activities, such as producing bikes, food, urban farming; and finally sectors of the new economy. Few others considered basic repairs to be manufacturing to be important however it was very difficult to distinguish between a company that built and sold bikes and one that simply repaired them. Urban based agriculture also was not totally dismissed as interviewees understood its link to issues such as the circular economy however it depended entirely on the type of agriculture.

Finally a more strategic position was presented by Patricia Foscolo from Impulse, that it should be focused on sustainable urban production, which is harmoniously integrated into the urban context. The only criteria for keeping production in town should be sustainability and the coexistence of workers, consumers and researchers.

The classification trap

Many interviewees questioned the ability to find terminology or a definition that linked to statistical data echoing management consultants 'if you can't measure it, you can manage it'. Many respondents referred to the European nomenclature

system, the NACE codes.

Regularly, interviewees stressed a lack of trust of the nomenclature system⁶⁶. For example a large assembly factory in Brussels that clearly falls into material production is classified as a service according to the NACE codes. The opposite also occurs: Coca Cola is identified as a food and beverage producer however only has a warehouse in the region. Businesses were also reported to register under service codes for market-related strategies⁶⁷ - for example three major industries as SABCA, Audi, Viangro are registered in wholesale trade. In France, the change in nomenclature meant that there was a sudden 20% decrease in employment related to the industrial sector.

Employment has changed radically with technology and automation even though businesses are still producing similar products; SABCA employs a large number of engineers in research and development that spend much of their time behind desks operating software than those on the factory floor. The NACE code system also does not provide a clear indication of the complexity of modern workplaces where work is either outsourced or done by freelancers under contract. Classification has proven to be a hazard when proving regional statistics. Aynah Gangji (IBSA) showed that by adding associated services such as design, circular economy and construction, the total value added arrives at 12.6%, rather than the 2.9% for the 'manufacturing sector' alone.

There are a range of alternative approaches. Perspective, uses SITEX, which focuses on buildings and serves as base for planning documents (i.e. regional land use plan - PRAS). Citydev's (Inventimmo) classification takes into account the building type, studying the occupants and linking the information on company activities with their building but only registering sites over 1000 m². A final solution is the Labour Force Survey, that focuses more on the work and workers rather than the businesses used in NACE.

2. SHARING AN ECONOMIC VISION

According to most local organisations and key actors, one of the most critical issues regarding urban manufacturing is the lack of a territorial level economic vision for the Brussels Region and certainly no vision for the larger metropolitan area that includes Flanders and Wallonia. With different political parties representing different agencies and portfolios, rarely is investment made without conflict or coherently integrated into established plans or strategies. Without an economic vision, it is very difficult to create joined up economic development, linked with local business, local research, local residents and the local market. As a result, Brussels is famed for a large number of small initiatives and projects, while many however struggle to become mainstreamed or survive in the long-term.

Manufacturing - a critical economic issue

The first question is to ask why things should be made locally? Today, Brussels' economy is organised in sectors (housing, retail, office space and so forth). The economy isn't seen as an integral part of urban planning (such as Perspective, the BMA and Bruxelles Environnement) or development (Citydev, SAU, the Port), as those dealing with urban development generally don't have this expertise⁶⁸. Various interviewees noted the importance of keeping a variety of productive activities in the city to guarantee a healthy economic base. Ideally this would support a range of opportunities including: low and high skilled jobs, local innovation and particularly the capacity to locally produce goods for the regional market (known as the 'short-circuit economy').

Furthermore, one respondent noted the actual challenge for Brussels' economy is to bring back value locally⁶⁹ in terms of monetary and physical value. Currently most of the value generated due to business development or university research leaves the region or goes abroad which

does not support local communities.

Despite the high local unemployment, one reason for exporting production is the expensive labour rates - those businesses that remain are pushed towards automation.

Finally even if local manufacturing were to grow, one respondent noted that while some 15% of industrial land remains vacant, only 5% of available industrial land is currently on the market⁷⁰. Furthermore, the available land on the market involves large and complex sites that are outside of the scope of many smaller businesses. Spaces between are being developed, particularly by Citydev 100-1000m², yet it takes some 4-5 years between writing a brief and for the building to be completed.

Numerous respondents noted the challenge to build a shared vision and strategy for the economic future of Brussels, which includes manufacturing. However involve different regional actors and disciplines⁷¹ and without a strategic vision it makes it very hard to coordinate research, communication and strategic investment⁷². Business as usual projected by the authors of the Industrial Plan¹⁸ will highly likely result in a gradual decline of manufacturing activity due either to alternative development pressure or lack of regional support.

An economy of proximity?

Throughout the interviews there was a regular discussion on local jobs provided through manufacturing that were essentially divided into two fundamentally different concepts for the future regional employment. One accepts or supports the disappearance of low-skilled jobs for a shift towards a specialisation in the digital economy. The other stresses the importance of sectoral diversity, to encourage urban economic growth supported by interaction between sectors.

Projections for job growth in the Region of Brussels is oriented more towards services, while Flanders and Wallonia foresee a modest growth in manufactur-

ing jobs. One interviewee suggested that this trend towards digitalisation will not be beneficial for the Region as it will only increase the level of commuting as new work will be attract higher-educated workers living outside of the city.

Manufacturing is far from local, at least in terms of the larger companies. Around 10% of Audi's employees are local to Brussels while another large employer, SABCA, also imports a lot of its high-skilled labour. Local tap manufacturer, RVB, conferred that their policy not to support company cars meant that they have lost several suitable skilled workers, forcing them to reduce dependence on labour through automation.

Furthermore, discussions regarding the link between manufacturers and local research organisations and universities has been hard to define. It was very unclear how much local manufacturers were themselves involved in research and developed within Brussels and which organisations supported them.

This very issue could be seen as an opportunity in itself and proves that there is a serious lack of formal joined up policy between manufacturers, training and research and development.

3. FINDING THE RIGHT MIX

The current strategy to reintroduce industry and manufacturing in the Region of Brussels clashes on the one hand with the demographic boom resulting in a growing demand in the housing market, and on the other hand with the large presence of (empty) office spaces. Brussels' planning tools that should encourage mixed developments are not connected to clear typologies or spatial models, nor to a clear idea of the kind of productive activities that are compatible with the urban realm.

Housing and offices vs productive spaces

The massive development of office spaces until the end of the 1990's transformed a number of industrial sites and mixed working neighbourhoods. The

Region's average office vacancy rate is now 8%, 6% in the city center and up to 12% in other neighbourhoods. For the Flemish region bordering Brussels in the north (Zaventem), vacancy is upward of 30%.

Now the trend is for housing - but is it really necessary? Various interviewees considered that the housing market will soon be saturated with high-end apartments in the wrong end of town. Today the actual demand is for affordable housing and social housing, while a large number of projects under construction foresee luxury or middle-class units. One such example is the recently completed Up-site Tower, the city's tallest residential tower, located on the fringe of a poor neighbourhood and the working harbour precinct (the Vergrote Dock) - while the building remains heavily vacant, it has consequently put significant pressure on Heidelberg Cement (Inter-Beton) located diagonally adjacent the tower to invest in a new facility to minimise noise and dust. Heidelberg consequently launched a multi-million Euro redesign of their cement facility to minimise noise and dust - which shows their commitment to remaining in the city.

As noted earlier, there is an initiative based along the canal zone that involves a dialogue and research by design platform for developers in the catchment of the canal, allowing developers to build housing above industrial space. This rather informal approach may be the most effective way in reaching suitable design solutions to fit the city's remaining industrial land. However this initiative is not lead by an economic vision and there is no clear plan of the kinds of business that would occupy future available space.

Compatibility

A number of regional policies, such as the Region's Circular Economy Plan and the low emissions zone are pushing businesses to be greener, more local, and more compatible with urban environment. This includes urban farming, recycling and lower impact logistics.

The city's productive base is shifting. Certain businesses are leaving the city (due to issues cited in section 2.1) other city oriented activities are finding their way into the city. A process of "triage" (filtering out) is occurring, with new activities contributing to the quality of life in the city. The most obvious are numerous craft breweries (Brasserie de la Senne and Brussels Beer Project), while others cited earlier include Ahooga that produce folding bikes⁷³. However replacement is not happening one for one and new manufacturers need to adapt to a lower pool of available real-estate alongside other detractions of setting up shop within a dense and expensive urban area.

Citydev develops much of the Region's new industrial spaces and follows two selection criteria: firstly the quantity of jobs provided by newcomers (bias towards higher numbers of jobs) and secondly the possible nuisances produced (noise, dust and logistics). The range can be quite diverse - from suppliers of spare parts, to brewers, mechanics and high-tech SMEs (such as an optics company). However respondents from other public agencies provided criticism. Firstly some businesses are incapable of providing the job density expected, despite offering beneficial functions for the region. Secondly, there is no strategy to curate and combine compatible businesses that can be interdependent.

Irrespective of all the constraints, a range of businesses find Brussels to be the most attractive place to establish - be it for the proximity to the workforce, research institutions, a certain brand or simply because Brussels is the place the business calls home. The question should be reversed: what does the city offer manufacturers? How could new and established businesses make the city a better place?

4. LINKING SKILLS AND KNOWLEDGE

Another urgent, delicate and yet complex issue particular to the Region is the polarised and large presence of non or

low skilled labour around the city centre. The city boasts a population of 1.2 million and some 600,000 jobs. However there is an exceptionally high unemployment rate of 17% while the city has one of the highest income rates per capita in Europe. Such a problem is perverse when almost each manufacturer interviewed complained about the challenge to find suitably skilled workers. In contrast, there are a vast range of training organisations based in the Region, addressing a range of skill levels and in (more than) the two local languages - see Box 1. The challenge here is to link up supply of appropriately skilled workers with the demand for employment. This is not especially straight forward when industries change faster than the training sector can keep up with.

Unemployment and low skilled labour

The question of jobs is generally at the top of all of Brussels political agendas. The manufacturing sector dropped in Belgium from 16% in 2000 to 12% and in 2014, while in Brussels it dropped from 6% to 2.7% in the same period. Therefore the decrease in manufacturing jobs may have played a small but fairly subtle role in this unemployment quandary.

What kinds of business could have a positive social impact on local employment? Some respondents suggested the answer could lie in manufacturing, productive activities and training centres⁷⁴. Is this a romantic idea or a possible new business?

Is the manufacturing sector a source of low-skilled work? Roughly 80% of the industrial sector consists of highly qualified workers (white collar) and 20% of low qualified workers (blue collar), reflecting contemporary services oriented and highly mechanised businesses. This shows that jobs within manufacturing are relatively small compared to the larger job deficit.

By contrast, it is reported that there remains a significant amount of lower skilled workers (including illegal migrants) supported through informal work. The

second-hand car market in Cureghem is one such example. While researchers suggest there are thousands of such informal jobs, they simply do not show up on statistics.

On a positive note, there is a niche which may be exposing a place for low-skilled employment. A number of established businesses are showing how social enterprises may offer affordable services for repetitive tasks while providing stable work under good working conditions. Travie is one such operator, established in 1980 that employs some 450 handicapped workers. CF2D is a non-profit established 15 years ago, focused on recovering and repurposing technology, employing almost 20. Such businesses can provide important value for the region however also require support for suitably accessible locations, training and financing for support staff. The net result could be far lower levels of unemployment, lower mental health issues, community building and pathways to other jobs.

Adapting to demand: training and education

Interviewees regularly noted a mismatch of training and skills and questioned the capacity of local training facilities. One interviewee specialised in employment cited that the local workforce can fill a large amount of the employment opportunities⁷⁵ - some job openings receive thousands of applicants with numerous relevant candidates.

Large employers have very specific needs and tend to do a lot of training in-house. SABCA seeks qualified profiles and they have established a bespoke training plan, working directly with Actiris. AUDI tends to do the same and have signed a convention with Actiris and have agreements with the Dutch and French speaking training centres (SYNTRA and SEFA).

As noted earlier, there is no shortage of skills and training providers. This could be seen as both a strength and weakness. Employers regularly criticise the local training facilities, not matching the correct skills for the job. Public agencies suggested that it was challenging to link training and jobs, when the jobs and technology changed rapidly.

Education could start at an early age and possibly within the basic school system. One interviewee suggested that there is a strong lack of vocational and practical technology based learning which means that kids have little practical experience of making things themselves when they leave school⁷⁶.

Finally, low-skilled jobs will not disappear, however there may be greater levels of growth in supporting sectors. Logistics for example, with the implementation of the low emissions zone, is an area where a rise in lower energy modes could be foreseen to build on the 30,000 strong sector. Repair, recycling and waste management is another sector that could see growth.



AHOOGA

AHOOGA

Please read carefully to following table and use your order reference. If you have any questions, please contact us.

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APPENDIX 1: BRUSSELS ACTORS

The Bouwmeester / Maitre Architect (BMA) is the Brussels Region Architect, which is an independent office advising architectural matters concerning the regional urban development. The team of architects and urbanists are currently supporting work closely with a range of other regional actors such as Perspective, the SAU and Bruxelles Environnement. Thanks to its position independent of the regional authorities, the City Architect has a certain freedom in its function.

Brussels Enterprises Commerce and Industry (BECI, Chambre du commerce et de l'industrie) is an employers' federation that represent and provide support and professional training for Brussels' companies and independents. They are one of the main partners of Cities of Making Brussels, are very active in public debate and have a great interest in the matter.

The **Plan Canal** is a authoritative document that stresses the regional objectives, planning principles and priority strategic zones for further urban development in Brussels. It has been supervised by Alexandre Chemetoff and regional administrations and was delivered in 2014. The purpose of this document was not to have concrete and practical propositions but more to identify general and consensual principles. The Canal Plan is still today a reference for public and private actors involved in urban planning and manufacturing development.

Circular Economy Regional Program (PREC) is the regional development document that

aims to transform environmental goals in economic and job opportunities. Numerous concrete projects are identified in order to apply a circular economy model to Brussels. The Circular Economy Regional Program has been approved by Brussels' government in 2016.

CityDev is the region's public developer, managing real estate development of economic, housing and mix projects. It is a key player in the recent history of the establishment of productive activities, notably in charges of several economical and scientific zonings. Citydev is also a famous actor of urban renewal, producing middle class housing in order to keep them in the regional area. The regional authorities allocates significant financial means to this operational institution with which they manage a considerable area in the region (196 ha in 2016⁹⁷). Citydev has been an important proponent of social and functional mix in the inner-city neighbourhoods. They are proponents of a certain amount of classic industrial areas, in order to retain "heavier" manufacturing activities that are not always compatible with housing⁹⁸.

Company in Urban Area Zone (ZEMU) is a type of mixed zone created in 2013 and integrated in the Land Use Regional Plan. This zone allows productive activities (with a limitation of 2000 m² per project), commercial functions, public infrastructures and housing on the concerned areas. In the last years, the Company in Urban Area Zone have replaced significant areas of industrial and monofunctional zones. Therefore the real estate development have put a considerable pressure on manufacturing

activities that are moving out of the city.

Goods Transport Plan is a regional plan developed by the Brussels Mobility administration. It aims to ensure supply, improve its efficiency and its integration to logistic coordination while reducing its nuisances. Adopted by the regional government in 2013, its implementation is in progress.

Cabinet Gosuin is the ministerial cabinet of the regional minister Didier Gosuin of Economy and Employment (2014-2019). The cabinet develops aspects of the political portfolio and collaborate directly with the minister. The minister is also responsible for Health Policy, Civil Service, Finance, Budget, Heritage and External Relations at the Joint Committee of the Common Community Commission (COCOM) and in charge of Vocational training for College of the French Community Commission (COCOF). Hence, this administration has a certain power concerning Brussels' economic policies. In 2017, Didier Gosuin announced that he would deliver in 2018 an Industrial Plan for the capital.

Impulse (now called Hub.brussels) is the Brussels agency for companies with an important role in providing supporting services and project development. From 1 January 2018 Impulse has merged with Atrium and Brussels Invest and Export which are organizations that provide support to business, forming an accompaniment and supporting pole. That has been made in the frame of the government effort in rationalizing its institutions, forming three main poles: (i) Impulse (ABE-BAO): the Brussels agency for the accompaniment of the company;

(ii) Finance Brussels - the financial center - with Innoviris ; (iii) CityDev and SAU, which are the urban development pole. The approach at Impulse is sectoral because the work is subdivided according to specific priorities (IT, Lifetech, Green - in the Regional Innovation Program). Its economic coordination cell supports company - especially those with a particular number of employees who have a certain weight on the Region - helping directly with their business, permits, conflicts and so forth while connecting with political actors.

The Industrial Plan is an industrial development program that have been announced by Didier Gosuin in 2017 due to a request from the trade union FGTB. Hence, this program didn't represent a specific ambition from the regional minister of Economy. At first, its administration had only but the general goal of promoting manufacturing, high-tech production and creative activities. Then the research center Environmental management and Land Use Planning Institute (IGEAT) of the Brussels' Free University (ULB) received the mandate to develop his program to deliver the Industrial Plan in June 2018.

Innoviris is the regional institute that promotes scientific research and innovation for companies but also non-profit organisations or research centers. They develop and want to develop industrial technology in Brussels, directly linked to spatial planning. For instance their Doctiris program supports PhD projects on industrial issues, making a bridge between university and companies or administrations. Recently, Innoviris has taken a broader set of topics and emphasize the research on social inno-

vation, civil society's projects and start-ups development, in addition to industrial technology research⁹⁹.

Inventimmo is a branch of CityDev that specializes in professional real estate in the Brussels Region building an updated on-line inventory of existing offers - office buildings, commercial areas, warehouses, workshops, and land. It originated from the idea to keep productive spaces in Brussels, and the goal was to keep and enhance mix in the city, through a door-to-door survey contacting directly the owners. Today, 99% of these workshops have changed function. The interest in urban mix has recently came back into interest, but prices prevent this diversity to return. A limit of Inventimmo's survey is that it does not consider spaces below 1000 m², due to their lack of means: however, the entire number of spaces below 500 m² corresponds to a minor % on the total overall productive surface in Brussels.

Regional Plan Land Use (PRAS) is the reglementary document that stresses the rules in terms of land use in the Brussels' region. It's one of the most important plan in urban planning policies. The Land Use regional Plan has been modified several times and have always been the object of controversy. For instance the last versions of the Land Use Regional Plan have transformed several monofunctional Urban Industry Zone in Company in mixed Urban Area Zone, allowing housing development in these economical areas.

Contrats de quartiers durables (Sustainable Neighbourhood Development Contracts) are urban renewal programs assigned to neighborhood areas

for a limited time. The finance of these programs usually comes from regional and, to a lesser extent, municipality. Middle class housing, public and green spaces, social cohesion and public infrastructures are the priorities here. Through these amenities regional authorities aim an increase of the quality of life for everyone in these neighborhoods. However, academics and civil society have criticised their involvement in gentrification processes.

Perspective is a regional territorial research and planning organisation that works between public and private interests. Perspective are very concious of the future of (urban) manufacturing. The Plan Canal (300ha of public property along the canal with a huge potential in terms of housing, economy, mobility) was the first step to understand how to imagine the future of productive activities and the first clear claim by the Region to set up and maintain industry and manufacturing in the city. More recently, Perspective is working on how to maintain industry in the city on a small scale, negotiating directly with companies to plan their possible integration in the urban fabric. That can bring many advantages guaranteeing their longer stay thanks to contract of 10-15 years with the Port Authority.

The Port of Brussels is the public port operator, managing 105 hectares of harbour land along the canal. The Port of Brussels have defended for years the place of goods transport and logistic activities in the city. They recently produced a Masterplan 2030 that stresses developments to come according to the strategy of regional authorities.

Sustainable Development

Regional Plan (PRDD) is a strategic document describing the regional authorities' decisions and orientations for further urban development in Brussels. Its purpose is to be implemented in reglementary plans such as the Land Use Regional Plan. This plan has 4 main axes : (i) urban planning and housing, (ii) environment, (iii) economy and (iv) mobility. Strategic zones are identified and will receive specific attention through particular urban development plans.

Urban Economy Stimulation

Zone (ZEUS) is a project or zone that would frame a financial incentive policy towards companies in order to promote the employment of local labor. Even if the idea has been framed and approved by the regional Parliament, its implementation and relative adjustments have never been made. In 2017, Didier Gosuin conceived this strategy and declared it will be in the future Industrial Plan.

Urban Development Society

(SAU) is a public developer of larger sites of public interest. Their goal is to specifically develop strategic zones identified by the regional authority and according to its urban planning policies. To that end they frequently work with Perspective and the BMA, following the Canal Plan.

Urban Industry Zone (ZIU) is a type of land use zone assigned to productive and logistic activities. Several areas of this type have been transformed in mixed zones during the last years in Brussels.

APPENDIX 2: MAPPING DATA

Separate Industry Maps

Each dot represents an individual business registered with the NACE code related to the described industry
Source: ORBIS database [web]

Manufacturing Maps Urban Regions

The maps give an overview over industrial land use in each urban region.

Sources map Brussels: Urban Atlas – Copernicus Land Monitoring Service accessed April 2018. [web]

All locations of registered business in the metropolitan area from ORBIS database NACE sector C Manufacturing. [web]

APPENDIX 3: SUMMARY OF INTERVIEWS

<u>Name</u>	<u>Organisation</u>	<u>Date</u>
Kristiaan Borret Julie Collet	BMA	19/06/2017
Jeremy Levin	Innoviris	21/06/2017
Elsa Colsado Ralph Boswel	Perspective	27/06/2017
Amynah Gangji	Perspective (IBSA)	28/06/2017
Jan Ackenhausen	Perspective	28/06/2017
Sven De Bruycker	Perspective	28/06/2017
Philippe Lefrancq	Ahooga	24/08/2017
Patrick Van Den Abeele	Bruxelles Environnement	24/08/2017
Alain Doornaert	Citydev (Inventimo)	31/09/2017
Patricia Foscolo	Impulse (now Hub.brussels)	3/10/2017
Frédéric Reynaud	Perspective	4/10/2017
Walter Tempst Jan Zaman Koen Vermoesen Tinne Verheyen	OVAM Departement Omgeving VLAIO VLAIO	4/10/2017
Claire Scohier	Inter-Environnement Bruxelles	8/10/2017
Laurent Schiltz Hugues Kampeneers	Confederation de la Construction	14/10/2017
Alain Gillieaux	RVB	18/10/2017
Caroline Philippe Isabel Zerard	Bruxelles Economie et Emploi	9/11/2017
Valerie Tanghe	Port de Bruxelles	28/11/2017
Mariane Thys Charlotte De Broex	Bruxelles Mobilité	4/12/2017
Olivier Menalda Claire Heughebaert	SAU	4/12/2017
Arianne Wautelet	Innoviris	5/12/2017
Moritz Lennert Gilles Van Hamme Max Tihon	ULB (IGEAT)	21/12/2017
Emmanuelle Pottier	Actiris	6/12/2017
Rene Konings	Agoria	8/1/2017

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