



ECONOMY

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PARIS REGION: PROFILE OF A GLOBAL INNOVATIVE TECH HUB

WITH THOUSANDS OF STARTUPS, RENOWNED RESEARCH CENTERS, AND TOP 100 UNIVERSITIES IN THE SHANGHAI RANKING, THE PARIS REGION HAS BECOME ONE OF THE TOP 10 INNOVATIVE REGION IN THE WORLD. THE FRENCH CAPITAL REGION OFFERS OPPORTUNITIES, OFTEN UNHEARD-OF, TO INNOVATORS OF ALL KINDS. DISCOVER THE ASTONISHING POTENTIAL OF THE PARIS REGION.

Disclaimer: This note was redacted in the midst of the COVID-19 pandemic. The consequences of this crisis are still vastly unknown and it is therefore difficult to predict the impact it will have on the innovation ecosystem of the Paris Region.

The Paris Region is characterized by a diversity of economic and institutional players. Its GDP is comparable to the Netherlands and has Europe's highest concentration of Fortune 500 corporations. Today it occupies a preponderant place in Europe by its economic weight, but also by the characteristics of its innovation ecosystem. How to explain this density and this dynamic? How is the region able to be competitive regarding world-cities such as New York, London or Shanghai?

PARIS REGION: A POWERHOUSE FOR EUROPEAN INNOVATION

The Paris Region innovation ecosystem is marked by diversity. With universities, large companies, startups, public and private research laboratories working on a wide range of innovative products and solutions, it has become the world's first destination for R&D investments. The region houses more than 12.2 million inhabitants, 18 % of the French population, a third of which have a tertiary education and/or work in science and technology (Eurostat, 2018). This high proportion reflects the high quality of the educational landscape as three of its universities, Sorbonne University, Paris-Saclay University and Ecole Normale Supérieure, rank in the top 100 of the Shanghai ranking.

Knowledge production

In terms of public research, the region is home to more than 700,000 students (MESRI, SIES, 2018), which represents a quarter of the national student population. Among them, 30,000 Ph.D. students continue to feed the innovation processes of universities and private partners. These laboratories are mainly within Paris or its close surrounding (Condorcet, Nanterre, Villejuif, Creteil...) or also located in dedicated suburban campuses such as Paris-Saclay, Evry Genopole, Cergy-Pontoise or Cité

Top 20 of patent filling entities in 2019 in the Paris Region



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Source: INPI

Descartes in Marne-la-Vallée. Further, researchers from public institutes and universities produced more than 500,000 scientific publications during the period 2007-2017, mainly in the field of medicine, engineering science, physics, biochemistry, genetics and molecular biology. The biggest contributors are the national center for scientific research (CNRS), Inserm, Pierre and Marie Curie University, and Paris-Saclay University.

With a R&D workforce of more than 165,000 and an estimated 20.2 billion in gross domestic expenditure on R&D, private and public laboratories benefit from exceptional funding and workforce that allows them to innovate across sectors and industries. Continuously, private firms also play an important role in the knowledge production of the Paris Region. In 2019, companies of the Paris Region filed more than 7,500 patents to the French patent office. The biggest contributors were PSA, a global automobile manufacturer; Valeo, an automobile supplier; and Safran, an aeronautics company (Figure 1). Valeo invested more than 2 billion euros in R&D in 2018 to imagine and create the mobility of tomorrow through self-driving technologies, electric engines and other proprietary technologies. The company created Valeo.AI, the world's first research center in the heart of Paris dedicated to AI solutions for the automobile industry. Among the top 20 patent filling entities, automobile companies produced 40% of patents, making it the most innovative industry of the region in patent counts.

Such innovative firms are mostly located in and outside the city of Paris with a concentration towards particular sub-centers. More often than not, innovative firms locate themselves close to universities, creating innovative campuses. These campuses are located in the outer rim of region urbanized area but benefit from larger spaces, and often from colocation with universities and colleges. This is especially the case in Paris-Saclay where many public laboratories and higher education establishments have chosen to settle. The cluster houses more than 300 laboratories, 5,000 PhD students and support approximately 500 entrepreneurship projects from researchers and students. The Paris-Saclay cluster counts 2 Nobel prizes and 6 Fields medals among its researchers.

The link between laboratories and education establishments is strong in the Paris Region with many partnerships allowing Ph.D. students to develop their projects within private firms. These relationships between public and private laboratories and firms stimulate flows of investment toward research and innovation. Often, however, researchers choose to create their own startups.

Startups use the skills and technical resources of laboratories and universities, such as Genopole d'Evry, to test and develop their products. Continuously, during the operationalization phase, companies and laboratories discuss the

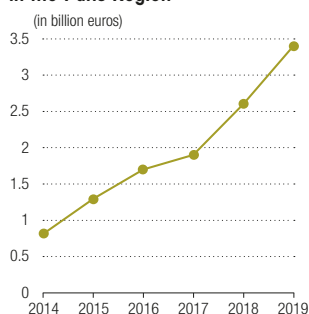
adjustments necessary to achieve a finalized product. Large companies then become early users who have detected significant application potential for their production processes or their products. This is the case of Connecting Food, a block chain startup which is now working with Nestlé and Casa Tarradellas for their brand of precooked hams Herta. The startup allows the companies to have a better control on its supply chain by allowing cutting edge tracking of the raw material coming from suppliers. The gains are mutual, as much for startups who benefit from access to a new market, gain in reputation and first feedback on their products as for large groups who see their processes and products potentially improved. France continues to set an example in Europe in terms of collaborations between large and young companies. More than 50% of the first 40 French capitalizations companies (CAC40) have their own incubator / accelerator or lab versus 42% for the first 40 German market capitalizations and only 25% for the first 40 British capitalizations (Bain & co, 2018). Further, the share of startups operating in the business to business (B2B) sector is prevalent, with 70% of French startups working in the business to business (B2B) sector, according to Early Metrics.

This process of partnership and reciprocal exchange is present throughout the innovation ecosystem, but it appears uniquely in universities and schools. In point of fact, many universities and schools offer acceleration and support programs to enable their students to start a business. Higher education establishments here connect their partners such as research laboratories or companies with entrepreneurial students. HEC, ESSEC and ESCP Europe, the top three business schools of the Paris Region, have among their alumni's more than 475 startup founders.

Entrepreneurial dynamics

The entrepreneurial landscape of the Paris Region is marked by its large amount of multinational enterprises (MNE) such as LVMH, Accord, Total or PPR but these large companies represent only a small minority of firms. The majority of companies have between 1 and 10 employees. In 2019, the region saw the creation of 244,147 companies (Insee, REE), an increase of 15% compared to 2018, 55% of them were micro-enterprises. The science and technology sector is the first contributor to this increase with +8,400 creations. These dynamics reflect the entrepreneurial spirit of the Paris Region. The French President Macron launched a movement of the "start-up nation" that seems to bear its fruits. With thousands of new companies each year, the startup community is seeing a positive trend. This trend is accompanied by the creation of many incubators and fab labs. The very popular Station F created by billionaire Xavier Niel offers 8,000 square meters of offices for young and promising companies. With only a few unicorns such as Blablacar, Critéo or Parrot, the French startup ecosystem is looking at a phase of maturity.

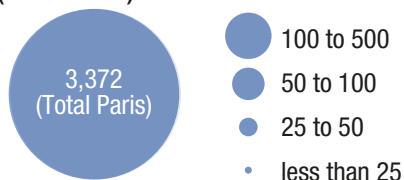
Investments of VC's in startups in the Paris Region



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Source: Dealroom.co

INNOVATION IN THE PARIS REGION: A DISTRIBUTED NETWORK OF COMPETENCIES

Number of innovation fundings by BPI France
(2013-2018)



Main places

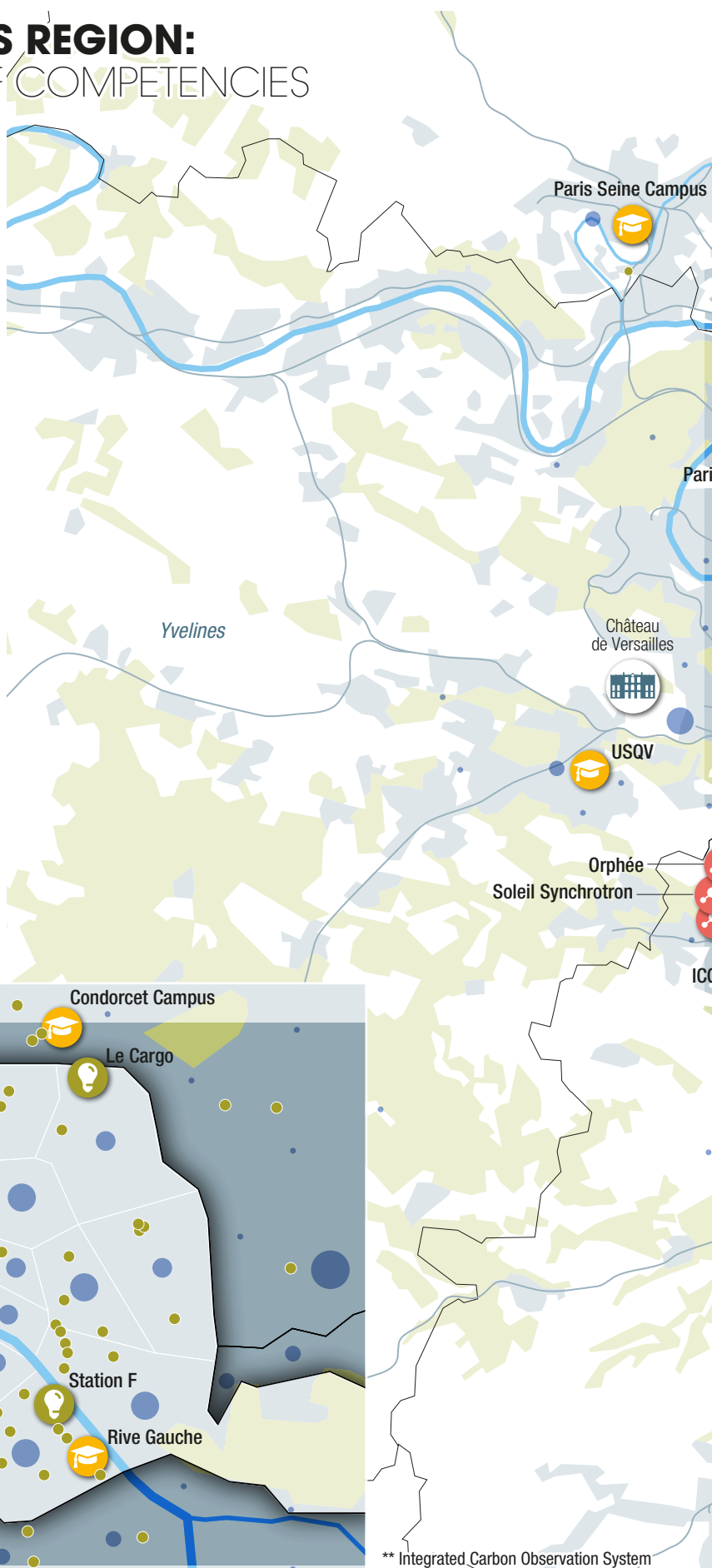
- Very large research equipment
- Campus - Main cluster
- Main incubator
- incubator

Transport

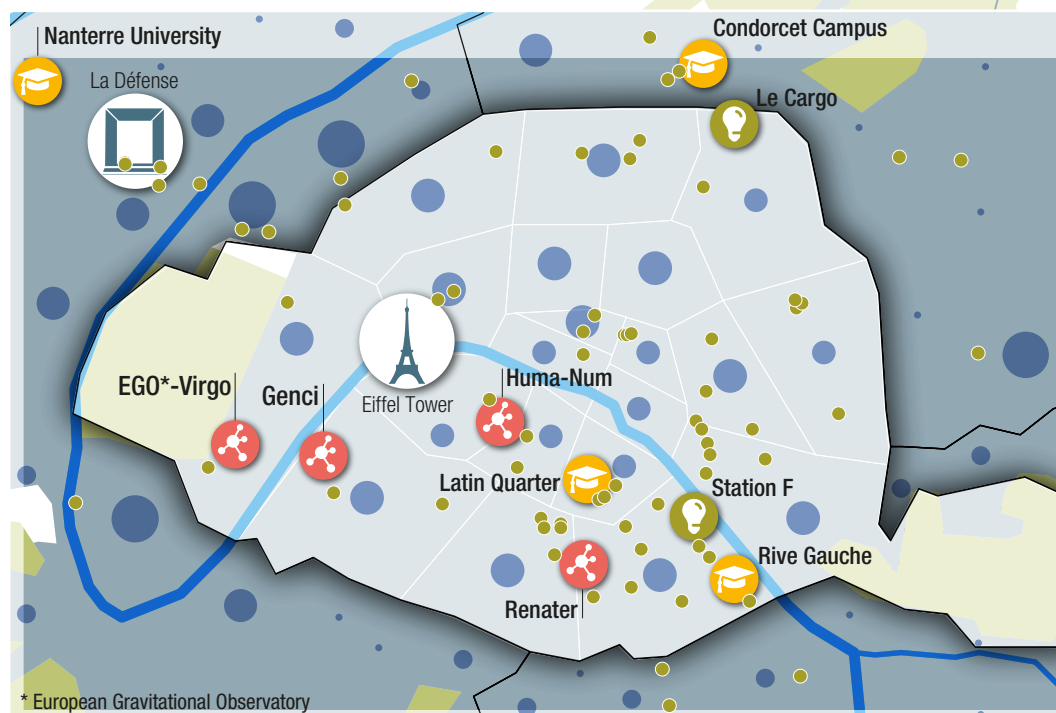
- International airports
- Rail network

Land Use

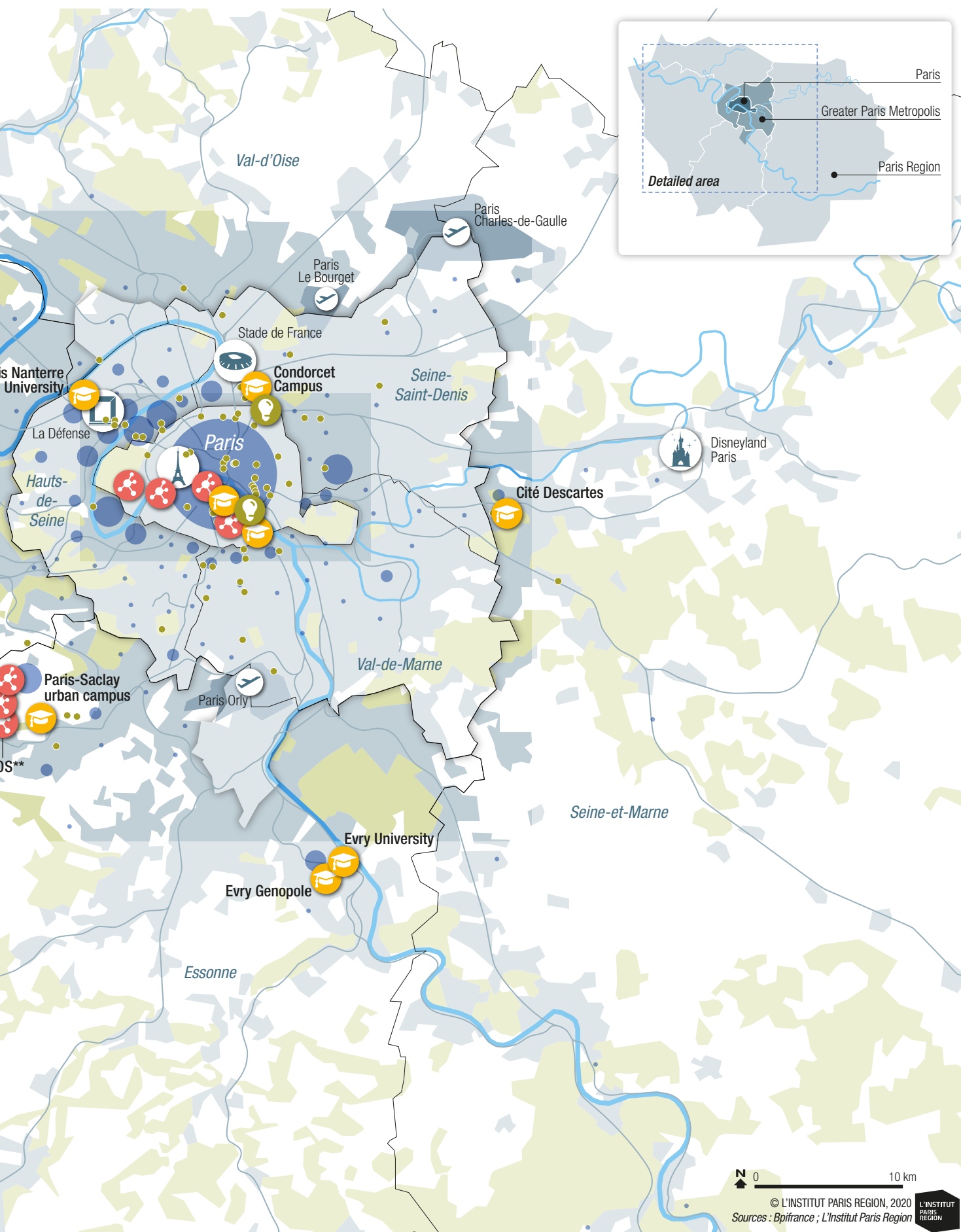
- Built-up area
- Wooded area
- Other areas
- The Seine and its tributaries
- County borders



ZOOM ON THE CITY OF PARIS



** Integrated Carbon Observation System



This movement is supported by “La French Tech”, a state initiative, which promotes French startups abroad but also seeks the next French unicorns among the huge cohort that represents 8,000 Greater Parisian startups.

Further, this new age of entrepreneurship made the creation of new places of work possible. Many coworking companies created huge shared open spaces destined for young and creative entrepreneurs. With hundreds of working stations, the Paris Region is embracing new ways of work in the digital transformation age. We can notably cite the coworking space Wojo, a joint venture between Accor and Bouygues Immobilier that houses more than 3,500 working stations in its locations. This new spaces stimulate knowledge spillovers.

Banks and investors

The Paris Region exhibits strong growth in the financing of innovative companies. The channels through which investment flows reach in companies are numerous, and take place at different levels. Indeed, the region, the state but also private investors all contribute to the financing of innovation.

According to Dealroom.co, private investment in the Paris Region's startup ecosystem has been very dynamic in recent years, the amounts invested grew rapidly from 818 million in 2014 to a whopping 3.5 billion in 2019.

This huge growth can be explained by the increased appetite of venture capitalists for European and more specifically, Greater Parisian startups. With privileged access to the local market and exceptional engineers, the Paris ecosystem is becoming a major hotspot for innovation in Europe and therefore venture capital. Besides these private investors, the state finances a large number of companies in their innovation processes. For instance, the research tax credit (CIR in french) is a generic measure to support the research and development (R&D) activities of companies, without the restriction of sector or size. Companies that incur basic research and experimental development expenses can benefit from the CIR by deducting them from their tax under certain conditions. CIR is one of the most used tools for the development of private innovation by the state. The Paris Region concentrates two-third of CIR which amounted to 6.49 billion and helped more than 25,000 companies at the national level in 2017. The number of companies benefiting from CIR increased sharply during the last ten years as it almost tripled between 2007 and 2017 going from 9,800 companies helped to 25,000.

Further, local authorities and public investments entities such as BPI France are close partners of incubators, third places and innovation networks. They help innovative enterprises through direct investments, grants, preferential loans and guidance programs. We can cite the Innov'Up program led by the Region and BPI France which offers grants and preferential loans up to 1 million euros to support innovative projects.

Networks and facilitators

Investors also allow young innovative companies access to an innovation network, thus ensuring companies the conditions to evolve in an environment conducive to their development. These networks are generally supported by facilitators. These facilitators are numerous in the Paris Region and each participates differently in the health of the regional innovation ecosystem. Thus, the eight major competitiveness clusters of the Paris Region bring together innovative companies, but also institutions, investors and research centers. The Cap Digital competitiveness cluster, created in 2006 and specialized in the digital economy, maintains one of the most extensive networks in the Paris Region with nearly a thousand members, including renowned higher education establishments such as the PSL University Paris or Centrale-Supelec.

These competitiveness clusters, specialized in their themes such as health (Medicen), aeronautics (ASTech), or deep Tech (Systematic Paris-Region), supported more than 2,600 projects and benefited of more than 9.2 billion in funding in 2019. This unique landscape generates exciting opportunities for cross-sector collaboration with for example, projects combining IT and healthcare, or automotive and eco-technology. The Paris Region can also count on société d'accélération du transfert de technologies (SATT). SATT are technology transfer acceleration companies. These companies were created by the impulsion of the state in 2010 as simplified joint stock companies to help finance maturing technologies and offer valorization services to public laboratories. These companies bridge the gap between startups, universities, public research centers and innovative companies to create fruitful relationships through patenting. Over 900 public laboratories and universities of the Paris Region are part of these networks.

Innovation networks are numerous but all rely on the principle of win-win, which show great results considering the number of firms, patents, and investments which all display an increasing trend during the last 10 years.

PLACES OF INNOVATION IN THE PARIS REGION: WHERE KNOWLEDGE MEETS TALENT

Innovation forces are distributed in the region and concentrate around areas where knowledge plays an important economic role such as campuses. Continuously the locations of innovation funding and therefore of innovative companies are often concentrated around Paris-Saclay (South-West), Paris-Seine Campus (North) and Cité Descartes Campus (East) and Paris. The west side of Paris is also a popular destination for innovative companies. This area is marked by the presence of large companies offering high value services such as finance, insurance, consulting and communications and located in business districts, the largest one being La Defense. This strong presence is matched by real estate offerings as this area concentrates 30% of the real estate stock of the region.

Top 30 Global Startup Ecosystems

City	Ranking
Silicon Valley	1
New York City	2-3
London	
Beijing	4
Boston	5
Tel Aviv	6-7
Los Angeles	
Shanghai	8
Seattle	9
Stockholm	10
Washington D.C	11
Amsterdam	12
Paris	13
Chicago	14
Tokyo	15
Berlin	16
Singapore	17
Toronto-Waterloo	18
Austin	19
Seoul	20
San Diego	21
Shenzhen	22
Atlanta	23
Denver-Boulder	24
Vancouver	25
Bangalore	26
Sydney	27
Hangzhou	28
Hong Kong	29
Sao Paulo	30



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Source: Startup Genome

THE PARIS REGION IMPROVES UPON ITS GLOBAL COMPETITORS

According to several recent international studies, the Paris Region is recognized as much more visible and attractive than 5 years ago. Numerous indicators allow to compare regions with respect to innovation. Benchmarks often take interest in the output of the innovation system such as patents, publications or gross domestic expenditure on research and development (GERD) but also qualitative measurements.

The Paris Region ranks among the best innovation ecosystem in the world. According to The Global Innovation Index 2019 which is the result of a collaboration between Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), the Paris Region places at the 9th position in terms of quality of its innovation where London ranks at the 15th position.

Because of its innovative profile, the Paris Region is the first destination for foreign direct investments (FDI) for R&D. Indeed, the region, with 47 R&D international investments, is for the first time the world's leading destination for R&D investments in 2018, with a 34% increase compared to 2017, followed by Singapore (42) and Bangalore (33)(KPMG, 2018).

Nonetheless, the Paris region faces a fierce competition in the startup industry with rising European ecosystems such as Copenhagen, or Amsterdam who benefited from important exits in the last years. Startup Genome, who publishes a benchmark of startup ecosystem around the world, ranks the Paris Region at the 13th position worldwide, and 4th at the European level.

Further, the scientific influence of the Paris Region, despite the rise of emerging economies, still ranks at the 3rd rank in terms of publishing volume behind Beijing and Tokyo and in front of New York, Washington, London and Boston (Elsevier). Continuously, the French scientific community is one the most internationalized, with more than 50% of its publications authored in the collaboration with a foreign researcher. Comparatively, the American co-publications with foreign researchers do not exceed 35%.

DYNAMICS AND PROSPECTS FOR THE PARIS REGION

As stated in the disclaimer, recent world events create uncertainty on the capacity of the economic world system to recover. Nonetheless, the Paris Region can count on numerous assets that will help its resilience and continuous growth. Indeed, with world-class universities, a fast-paced startup ecosystem and strong ties between the stakeholders of its innovation networks, the Paris Region has the necessary tools to recover. Never before, researchers, entrepreneurs, and facilitators have been more connected and supported. Continuously, the maturing phase of the regional innovation system that was engaged in the past years by the creation of supporting structures is an undeniable asset for future growth. The Paris Region must now ensure its rising position within the world innovation system by pursuing stronger efforts towards internationalization. This movement could be amplified by the recent need for global responses to global challenges, requiring collective and shared efforts of researchers around the world. The importance of the openness of the academic world towards international partners has been reaffirmed, this emphasized trend could be the propeller for further international collaborations in the tech world, benefiting the Paris Region and innovation around the world. ■

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