

Smart grids and smart cities in France

October 2016

Smart grids integrate digital technologies to improve the management of energy grids (electricity, natural gas and water). Using smart sensors combined with decision-support software, it is now possible to **optimize grid management** (e.g. remote monitoring, surveillance and meter readings), **save resources** (preventing pollution and leaks, etc.), and **improve consumer services** (e.g. speed of breakdown service).

According to the International Telecommunications Union, “**smart and sustainable cities** are innovative cities that use ICT to **improve quality of life, and promote efficient administration, urban services and competitiveness**, while meeting the economic, social and environmental needs of current and future generations”. Smart cities are built by combining IT with the various “bricks” of the city (energy, transport, building, etc.).

For example, **smart buildings** may be new (low-energy buildings, positive energy buildings, etc.) or old (energy renovation work), residential (connected homes) or non-residential (technical management of the building). Meanwhile, **smart mobility** brings together interconnected personal transportation solutions that are faster, more flexible, cheaper and greener. The rise in new mobility solutions (ridesharing, carpooling, etc.), low-carbon vehicles (electric, hybrids, etc.) and new-generation connected and driverless vehicles is helping to make mobility smarter and more sustainable.

Smart grids and smart cities are revolutionary and form **one of the pillars of France’s digital transformation**, offering **new market opportunities** for players in digital services, electrical equipment, and telecommunications. **France is already one of the leading countries for smart grids and smart cities**. Authorities and grid operators have also launched various initiatives and trials over the last few years.

Key figures for the sector in France



- France has around twenty manufacturers of smart meters and smart electrical equipment, as well as around one hundred integrators (setting up, taking readings, and maintaining equipment).
- Around thirty prototypes for smart neighborhoods are currently up and running in France.
- France has a number of companies (Veolia, Suez Environnement, EDF, Engie, Vinci, Atos, Schneider Electric) that are pioneers in the smart city industry.

France's market position

Europe's forerunner in smart grids and smart cities

- France is home to five of the ten best smart cities in Europe for environment factors according to rankings compiled by the University of Vienna. Montpellier tops the list.
- France is the leading country in Europe for R&D and experiments in smart grids (€505 million), ahead of the United Kingdom (€490 million), Germany (€360 million), and Spain (€355 million).
- In 2015 France exported €301.9 million in electricity and gas meters, putting it ahead of Italy (€246.4 million), the United Kingdom (€201.1 million), and Poland (€180.2 million).
- France is ranked first in Europe and fourth in the world for e-government according to the UN, and has also been judged to be the third best economy in the world for open data (Open Data Index, 2014).
- France is home to 31 smart cities of the 240 identified by the European Commission, compared with an average of 9.6 smart cities for each EU Member State.

The third largest global market for smart cities

- A recent report by Cisco estimated that financial opportunities in French smart cities will be worth as much as US\$182.6 billion (approximately €165 billion) by 2022, making France the third most promising market in the world, just after China and the United States.
- Out of a total of 245 million smart electricity meters to be replaced in Europe (which amounts to a combined investment of €45 billion according to the European Commission), France is the leading market (35 million units), ahead of Germany (32 million), the United Kingdom (27 million), and Spain (23 million).

Key information on the smart grids and smart cities market in France and worldwide

■ Key figures on the French and global smart grids market

US\$3 billion

The revenues generated by French firms specializing in smart grids in 2015, when they employed nearly 15,000 people.

US\$30 billion

The size of the global smart grid market in 2015. This is expected to increase to €111 billion by 2019.

€8 billion

The amount of investments planned in France by 2021 in smart electricity, gas and water grids.

46 million

The number of smart meters (electricity and gas) being installed in France.

Sources: Xerfi, Enedis, GRDF, Think Smart Grid, Transparency Market Research |

■ Key figures on the French and global smart cities market

US\$19,000 billion

The expected investment globally by 2022 in smart cities, including €4,600 billion from the public sector.

€182.6 billion

The size of the French smart grids market by 2022.

Source: Cisco

France's key advantages

A comprehensive and buoyant ecosystem



France is home to a number of global leaders in utilities, including Keolis, Veolia, and Suez Environnement. Having forged longstanding ties with public-sector decision-makers, these companies have set up **wide partnership ecosystems with foreign businesses** (e.g. Veolia with American company IBM and Chinese company Huawei) to enrich their skill bases and develop innovative solutions together for tomorrow's cities.

French expertise in contracting out public services guarantees stability



French local authorities are well accustomed to getting private companies to run public services such as waste management, water services, and public transport. These long established public/private partnerships in France ensures that businesses can enter into contracts with **legal certainty**, earn **ongoing income**, and enables them to test new innovations in partnerships with local authorities. **French cities have no hesitation in working with foreign businesses.** For example, Greater Lyon works with the Japanese technological institute NEDO and Toshiba, while Montpellier has signed a smart city partnership with IBM.

Commitment from the French authorities and public "cities of the future"

Digital development is a central issue for tomorrow's cities in the eyes of **78% of French people** (Ifop survey, July 2015). Nearly one in five French people surveyed said it was "a real priority" (18%). This **popular commitment to smart cities** is another advantage for foreign firms looking to design and test new utility services. Elected representatives are aware of the public's high expectations and have already rolled out digital projects for their city, particularly in **transportation, e-governance, and education.**

Major research and innovation capabilities



France has world-class research centers with increasing ties to the business world, including CEA, Centrale Supélec, École Polytechnique, ENS Cachan, Inria, Télécom ParisTech and Université Paris Saclay, which contributes to the LiveGrid initiative that brings together manufacturers, teachers, and researchers.

France also boasts a large pool of highly-qualified engineers whose salaries are lower than those paid in the United States, as well as a growing number of degree courses specific to smart grids, such as degrees offered by Grenoble INP, CNAM, ECAM-EPMI and EISTI.

A “startup nation” increasingly involved with smart cities

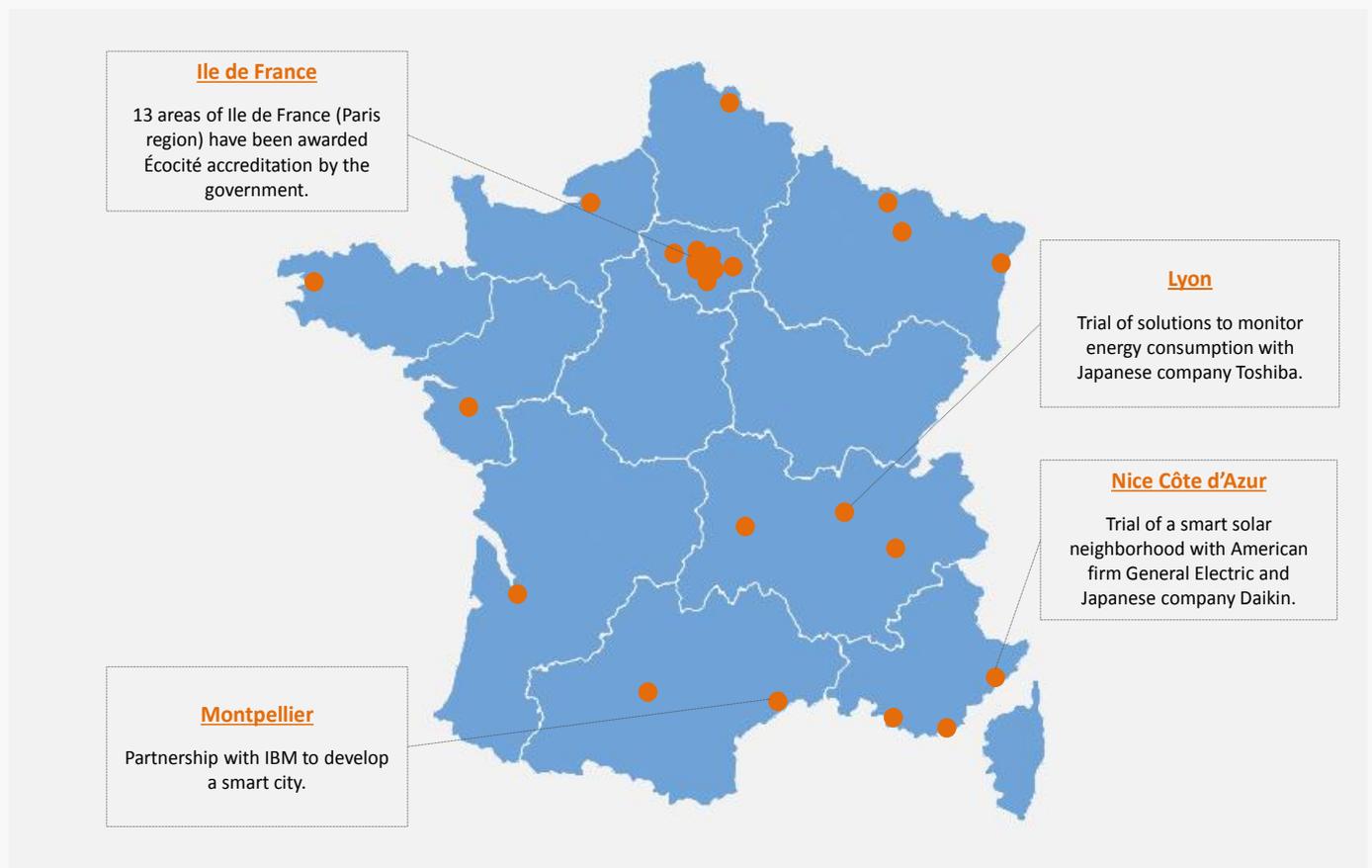


The development of the “Métropoles French Tech” (accredited digital cities) initiative is proof of **the capacity for French authorities to be “smart friendly”** and to create a virtuous ecosystem of innovation and technological/business opportunities, particularly for smart cities.

The buoyancy of the French market can be seen by the **large number of connected city startups that have been founded in recent years**, which include, for example, Cityzen Mobility (urban mobility), Embix (energy optimization consulting and software), Géovélo (urban mobility), WaysUp (home-work carpooling), and Zenpark (shared parking service).

Location of smart cities in France

■ The location of France’s main smart cities



Market opportunities

- **The rollout of smart meters by Enerdis and GRDF** is a real opportunity. Transmission grid operators plan to replace 35 million electricity meters and 11 million gas meters by 2022.
- **The many urban neighborhood construction/renovation projects in France** offer the possibility for the large-scale rollout of various innovative technologies and public service solutions in the smart city sector (Confluence in Lyon, Grand Bellevue in Nantes, Mosson in Montpellier, etc.).

- **Advances in ways of producing electricity (strong growth in green energies) and gas (rise of biogas and power to gas)** require grid operators (RTE, TIGF) to rethink and adapt their equipment to guarantee supplies to their customers. At present, RTE's annual investment exceeds €1 billion, which is another great opportunity for foreign companies. For example, in 2016 the Swiss electrical equipment manufacturer ABB was awarded a €22 million contract to supply transformers to RTE.
- **The rising number of French startups in the smart city sector means that there are significant opportunities for foreign firms looking to expand their business in France or acquire cutting-edge expertise** through acquisitions and partnerships (e.g. takeover of Mobile City by the Swedish company EasyPark's acquisition of Mobile City; American company SilverSpring's takeover of Streetlight, etc.).

Leading players in France

Examples of French companies

- **M2OCITY** (sales of €19 million in 2015), a Veolia subsidiary, develops connected solutions for urban grids, energy efficiency in buildings and smart cities. The company has already connected two million devices in more than 3,000 cities, covering more than a quarter of the French population.
- **SAGEMCOM** (revenues of €1.3 billion in 2015, 4,000 employees) is involved in manufacturing meters for the energy sector, with a complete range of smart meters for individuals and manufacturers at its plant in Dinan (Bretagne/Brittany).
- **VINCI** (turnover of €38.5 billion, 185,000 employees) works in all areas of the smart city industry (transportation, energy, communication and lighting networks, smart grids). It is helping to create the city of the future by renovating buildings and rolling out fiber-optic networks.
- **ATOS WORLDGRID** (sales of €92.1 million in 2015): energy supervision systems; **DELTA DORE** (revenues of €120 million in 2015): electrical equipment; **SCHNEIDER ELECTRIC** (turnover of €26.6 billion in 2015): electrical equipment; **SIGFOX**: low-speed telecommunications network, etc.

Examples of foreign companies already established in France

- **HAGER (Switzerland)** (sales of €1.6 billion in 2015, 4,000 employees in France) is a major manufacturer of electrical equipment. One of its main production centers is located in France, and the group is a key player in the Smart Electric Lyon project.
- **IBM (United States)** (global turnover of €73.7 billion in 2015 and nearly 10,000 employees in France) is one of the leaders in digital services and can claim to be a pioneer in smart cities. Its research center in La Gaude, near Nice, houses a center of excellence on smart cities.
- **DIEHL METERING (Germany)** (revenues of €3.1 billion in 2015) designs, produces, and markets meters. In France it owns the Sappel company (290 employees in France), which has a plant located in Saint-Louis (Grand Est region).
- **MICROSOFT (United States)** (sales of €3.1 billion in 2015) is helping to develop the IssyGrid information system, a smart grid project in Ile de France (Paris region). The company employs 1,500 people in France.
- **SAP (Germany)** (consolidated turnover of €20.8 billion including €1.1 billion in France in 2015) publishes smart grid management software, Intelligente Grid. SAP employs 1,500 people in France, including 1,000 in R&D.
- **CISCO (United States)** (consolidated turnover of €45 billion) is a computer equipment manufacturer and one of the first to conceptualize the smart city. France has been the location of many experiments for the group in this field, notably in partnership with Paris City Hall to measure footfall in public spaces.
- Most of the leaders in smart meters (**Itron, Landis+Gyr, Sensus, Diehl Metering**) and electrical equipment (**ABB, GE, Siemens**) have at least a manufacturing presence in the country.

Government support initiatives

France's research tax credit

Smart grid and connected city companies conducting research and development in France are eligible for France's research tax credit, which covers 30% of all research expenses up to €100 million (and 5% above this threshold), making R&D centers in the country extremely competitive.

A pillar of the "Sustainable City" plan

Smart grids and connected cities are fully integrated into the "Sustainable City" plan as part of the "New Industrial France" project launched in May 2015. This enables companies developing equipment and solutions for cities of the future to respond to calls for proposals, make use of an open technological platform and benefit from support measures, particularly financial support from Bpifrance, France's public investment bank. One example is the €50 million "City of tomorrow" fund exclusively for investing in startups in the smart city sector.

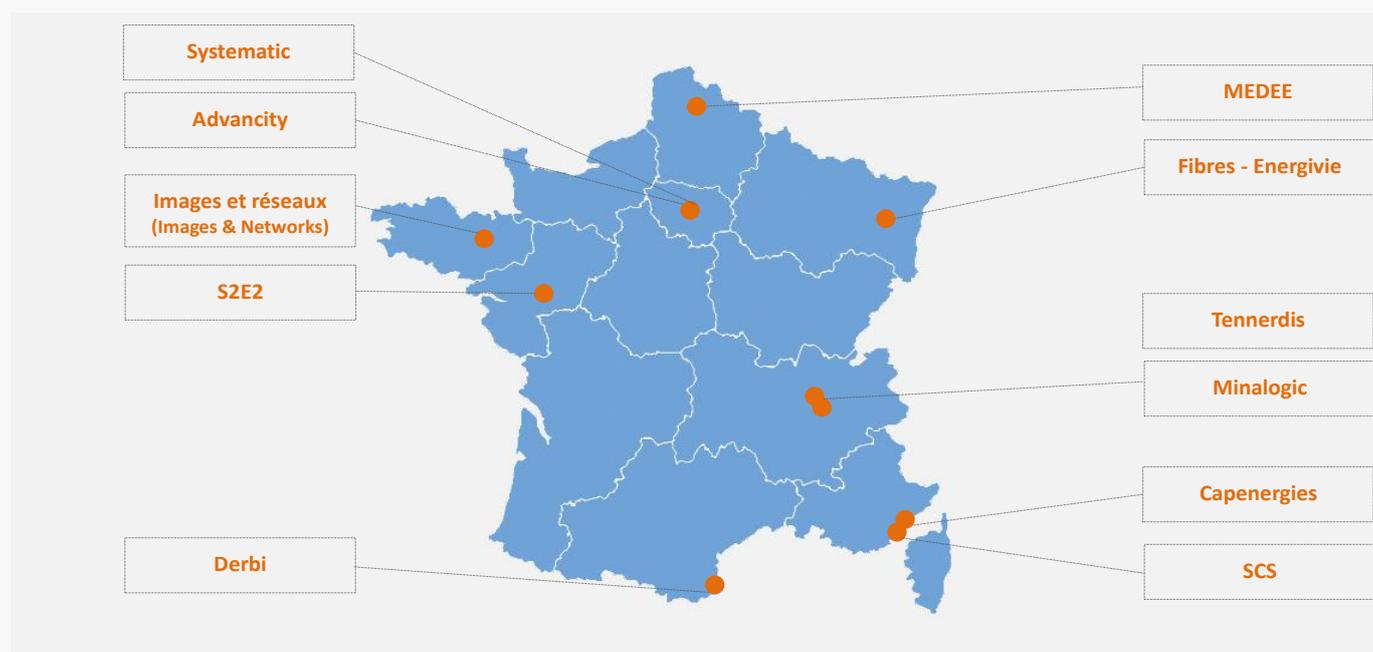
"La French Tech" initiative

Created in November 2013, the internationally successful 'La French Tech' initiative is driving the French startup ecosystem forward. Innovative companies working with smart grids and smart cities are a major part of this initiative, through which they can receive support to expand in France and boost their international profile. French Tech is a nationwide initiative led by startups, with government support only to manage the brand and financial support schemes.

Innovation clusters

Innovation clusters support and promote the development of particularly innovative collaborative R&D projects. They also support the development and growth of their member companies by the market launch of new products, services or processes resulting from research projects.

In 2012, eleven French energy and ICT clusters created **Interpôles SmartGrids France**, a cooperation and consultation initiative that aims to promote and develop the French smart grid industry (<http://smartgridsfrance.fr/>).





Advancity (www.advancity.eu) is a cluster in Ile de France (Paris region) focusing on sustainable cities. It brings together 160 SMEs and 13 leading major corporations, along with 31 higher education institutions. The various areas of “New Grand Paris” are also integrated into the cluster to offer opportunities for experimentation.



S2E2 (www.s2e2.fr), an innovation cluster focusing on smart electricity technologies for energy management, supports projects to integrate decentralized electricity generation into the grid. Based in Tours (Centre-Val de Loire region), its members include 173 SMEs and larger companies.



Based in Grenoble and specializing in the energy industry, **Tenerdis** (www.tenerdis.fr) helps businesses in Rhône-Alpes to maintain or expand their presence in the global low-carbon energies market. In addition to renewable energies, the cluster focuses on grid management and electrical storage, and has 203 corporate members.



Located in the Auvergne-Rhône-Alpes region, **Minalogic** (www.minalogic.com/) aims to support training, research and the French micro- and nano-technologies and embedded software industry to obtain a lasting competitive advantage in electronics and smart card embedded software. It has 330 members.



SCS (www.pole-scs.org/) (Solutions Communicantes Sécurisées) is a global innovation cluster located in Provence-Alpes-Côte d’Azur that operates in the fields of microelectronics, telecommunications and software. It has 302 members, 16 research and higher education institutions, and a working group focusing on connected cities.



Systematic Paris-Région (www.systematic-paris-region.org) is a global innovation cluster that combines software, digital and industry stakeholders, bringing together and coordinating an ecosystem of excellence with more than 800 members. To date, it has enabled the development of approximately 534 R&D projects worth a total of €2.8 billion that have received funding of approximately €1 billion.



The global research hub **Images & Réseaux** (www.images-et-reseaux.com/fr) established in Bretagne (Brittany) and Pays de la Loire, is centered on new digital imaging technologies and fixed/mobile networks. It has particularly targeted software and software engineering as an area of excellence.



The **Capenergies** (www.capenergies.fr) cluster is an energy transition player with a complete focus on non-greenhouse gas emitting forms of power. It leads initiatives in smart grids (Flexgrid project) and also finances training to install Linky connected meters.



Fibres Energivie (www.fibres-energivie.eu) brings together low environmental impact building stakeholders from the world of business, research, and training. It focuses on energy efficiency in buildings and is ultimately targeting positive energy buildings.



The **MEDEE** cluster (www.pole-medee.com) is a network of French and European players bringing together large businesses, innovative SMEs, laboratories, and universities. In addition to the energy efficiency of industrial processes, these research topics also have a particular focus on smart grids.



DERBI (<http://www.pole-derbi.com>) is a cluster in the Occitanie region for companies, laboratories, universities, training centers, professional federations, financial institutions, and local authorities involved in the development of the renewable energy industry.

Selected success stories

Examples of foreign companies investing in smart grids and smart cities in France

- **HUAWEI (China)** (turnover of €53.8 billion in 2015, nearly 800 employees in France) is a telecom equipment manufacturer that offers electrical communication networks and automated IP-based solutions for metering, billing and energy management. The group heads a basic research center for mobile technologies in Cergy-Pontoise (Ile de France/Paris region), an applied research center in Lannion (Bretagne/Brittany region) for innovation and a development center in the Paris suburb of Issy-les-Moulineaux (Ile de France).

- **TOSHIBA (Japan)** (consolidated turnover of €73 billion in 2014) has established itself in France in the smart grids and connected cities sector by jointly developing the Lyon Smart Community project with Lyon City Hall and Nedo (Japan's innovation support agency). It aims to make Confluence a new 'model neighborhood' for energy efficiency. Toshiba has also set up a community energy management system that collects data on things like infrastructure for recharging electric vehicles, renewable energy sources, and energy consumption points. The system then aggregates them with other external information such as meteorological data and air quality. The application of big data techniques to this information makes it possible to make different summaries for the project's stakeholders so that they can create value-added smart city services.

- **CISCO (United States)** is the world's leading company in network equipment. In 2015, it signed a partnership agreement with the French government covering six areas (education, entrepreneurship, security, infrastructure, smart cities, and public services), with a view to making France a leader in digital technology. As such, Cisco is committed to piloting one or two smart cities in France, similar to one already being trialed in Nice, involving managing traffic flows, public transport, electricity, road services, and security, among other initiatives. Among other Cisco contracts in France, the group is rolling out new network and Wi-Fi infrastructure in Paris with cameras to collect data from various sensors to reshape the way public places are used. Cisco also aims to invest US\$200 million in French startups, particularly in smart grids and smart cities. In October 2016, it opened its first innovation center in France in the Paris suburb of Issy-les-Moulineaux (Ile de France region).

- **GE GRID SOLUTIONS (United States)** (consolidated turnover of €3.8 billion, 2,550 employees in France) is a global leader in electrical equipment and software solutions for electricity distribution. It has grown considerably in France after acquiring 49% of French company Alstom Grid in 2015.

- **ITRON (United States)** (consolidated turnover of €2 billion, including €320 million generated by 1,000 employees in France) has several production facilities in France: Mâcon (Bourgogne-Franche-Comté region), Massy (Ile de France/Paris region), Chasseneuil (Nouvelle-Aquitaine), Haguenau (Grand Est), Saint-Priest (Auvergne-Rhône-Alpes), Argenteuil (Ile de France/Paris region) and Reims (Grand Est). At the Chasseneuil site alone, Itron produced 4.7 million smart meters in 2014, while also investing €3.7 million in manufacturing and research capacities in Mâcon. The production capacity of the Reims site was also doubled by setting up a second assembly line at a cost of €2.5 million.

Trade shows in France

Smart Grid+Smart City (Paris)

Trade fair on smart, sustainable and connected cities and regions – More than 80 exhibitors.

October 4-5, 2017 (held annually)

www.smartgrid-smartcity.com

Interclima + Elec / Batimat (Paris)

Trade fair for energy efficiency, renewable energies and connected solutions for homes and buildings.

November 7-10, 2017 (held every two years)

<https://www.interclimaelec.com/>