

An aerial night view of a city, likely Barcelona, with a network of white lines and glowing nodes overlaid on the image. The network consists of several concentric circles and intersecting lines, with nodes at various points. The city lights are visible in the background, and the network overlay is in the foreground.

# The Smart Cities Sector in Catalonia

November 2019

**Sector snapshot**

## The smart cities sector in Catalonia: Sector snapshot

### Catalonia Trade & Investment Government of Catalonia



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### Authors

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Anteverti

Barcelona, November 2019



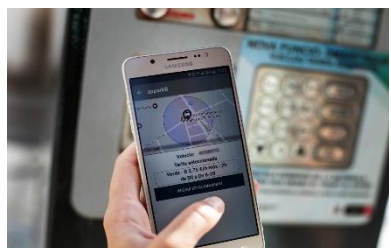
## 1. The smart cities sector



## 2. The smart cities sector in Catalonia



## 3. Business opportunities



## 4. Success stories

# 1. The smart cities sector



- The smart cities concept
- Smart cities are the conjunction of two major trends
- Benefits of living in a smart city
- The Sustainable Development Goals of smart cities

# The smart cities concept

## The smart cities concept

Cities are key socioeconomic and political players in the transformation of territories and the advance towards intelligent and sustainable global development in line with the Sustainable Development Goals set by the 2030 Agenda.

Smart cities seek to improve the quality of life of their citizens through sustainable, inclusive, transparent and participative initiatives that encourage efficient urban management using technology, innovation and the creation of knowledge.

## Companies in the sector

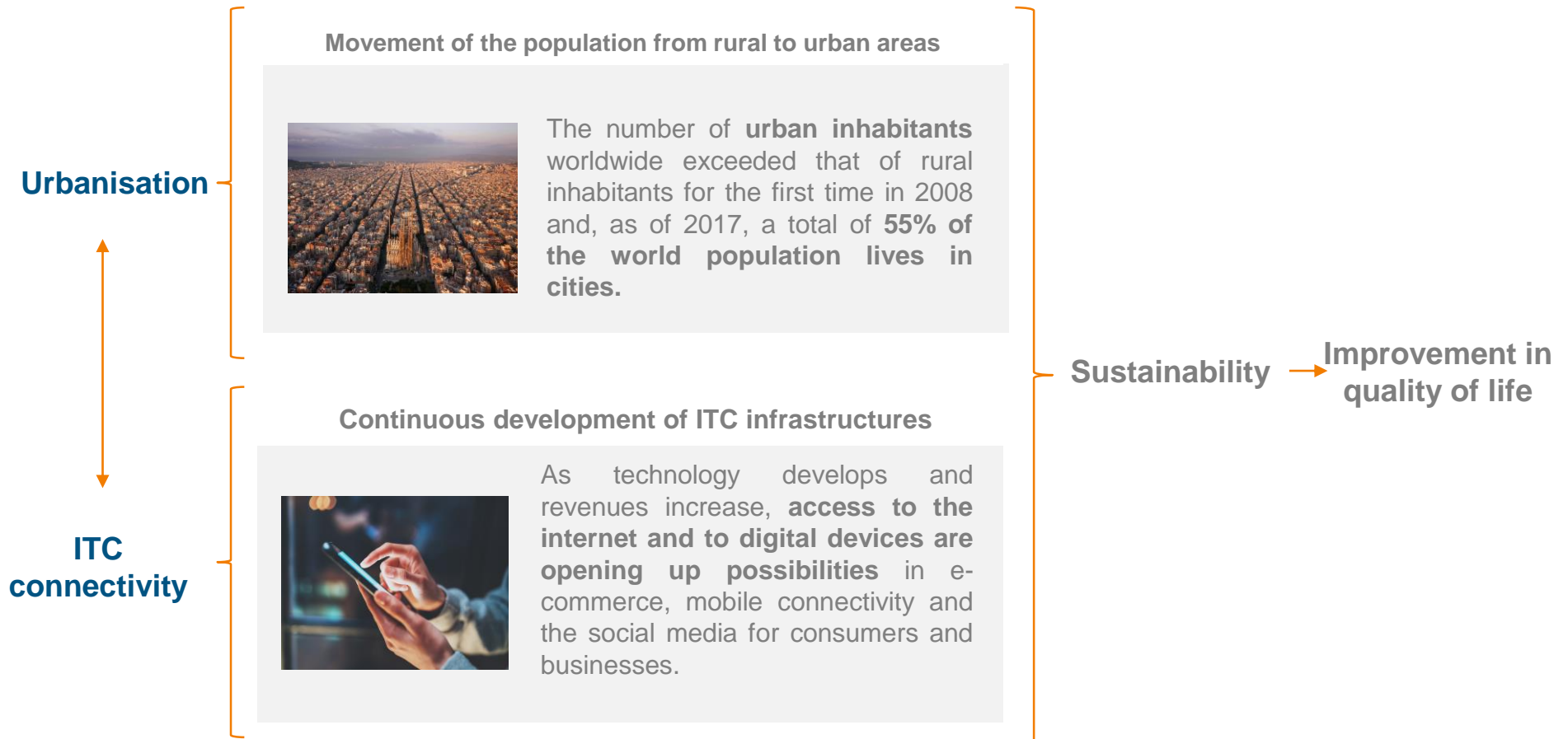
In this context, companies in the sector are all those offering smart solutions for the urban management of the city in its different verticals.

Unlike other sectors, the solutions offered must be flexible enough to adapt to the local demands of municipalities from all around the world and of differing sizes and characteristics.



Source: Anteverti

# Smart cities are the conjunction of two major trends



Source: Euromonitor

# Benefits of living in a smart city

## Inclusion of smart cities: extending the benefits to all residents

- Smart government
- Digital inclusion
- Smart security
- Connected citizen
- Smart education
- Smart health
- Smart tourism and leisure
- Cybersecurity

## Liveability in smart cities: the smart home

Smart management of:	Smart entertainment
Water	Security
Energy	Home automation
Lighting	Smart electrical appliances
Cooling	

## The **economy** of a smart city: innovation based on knowledge

- Knowledge economy
- e-commerce
- Smart retail and logistics
- Smart manufacturing
- Smart buildings
- Smart finances
- Highly qualified workforce
- Research & development

## Sustainability in a smart city: ensuring long-term development

Waste management	Houses with zero carbon emissions
Renewable energies	Forest preservation
Electric vehicles	Energy efficiency
Smart mobility	Air quality control

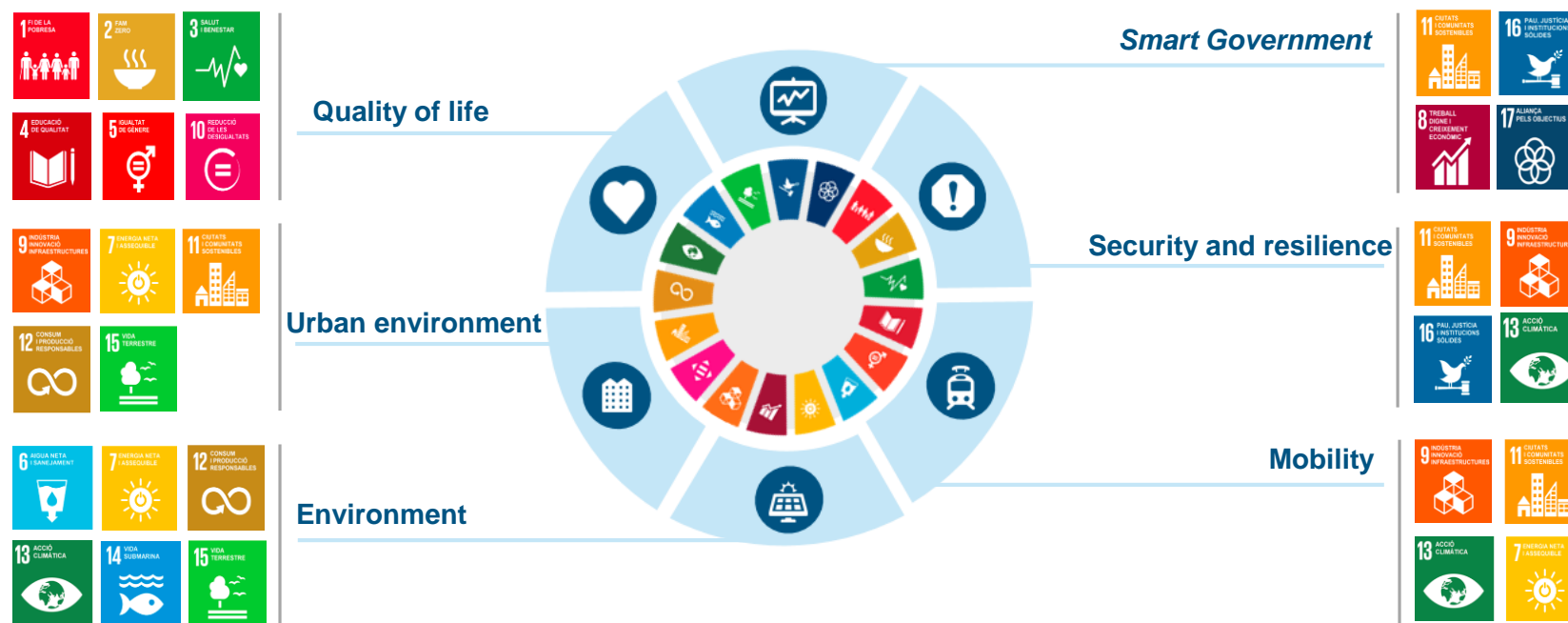
Source: Euromonitor

# The Sustainable Development Goals of smart cities



The **Sustainable Development Goals (SDG)** are a set of 17 goals and 169 targets of an economic, social and environmental nature aimed at transforming the world, included in the 2030 Agenda on Sustainable Development and **approved by the UN and the heads of state of 193 countries**.

The SDGs pose questions and propose milestones in relation to responsible consumption, the circular economy, productivity, and health and well being, where the alliances between the public and private sectors and society will be essential in meeting them.



Source: Anteverti based on the United Nations

## 2. The smart cities sector in Catalonia



- Key data for the sector
- Value chain of the smart cities sector
  - The smart cities sectors
  - The role of the company
  - Applied technologies
- The Catalan ecosystem supporting the smart cities sector
- The Smart City Expo World Congress in Barcelona
- Technology for smart cities made in Catalonia
- The Catalan university system and its commitment to knowledge in smart cities

# Key data for the sector

**438** companies in the smart cities sector



## Type of business

- **90% of the companies are SMEs** (between 10 and 250 employees)
- **52% of the companies were established over 10 years ago**
- **35% of the companies are startups and/or entrepreneurs**
- In relation to 2016, **the number of companies has increased by 62%**



## Turnover

- **€9.7 billions** turnover in smart cities
- **27%** of the total turnover of companies in the sector
- **4% of the total Catalan GDP**
- In relation to 2016, **the turnover has increased by 39%**



## People employed

- **45,046** employees in smart cities
  - **31%** of all employees in companies in the sector



## Territorial distribution

- **Barcelona** is the city with the highest concentration of companies in the sector, with **89%**
- This is **followed by Girona, Lleida and Tarragona** with lower percentages

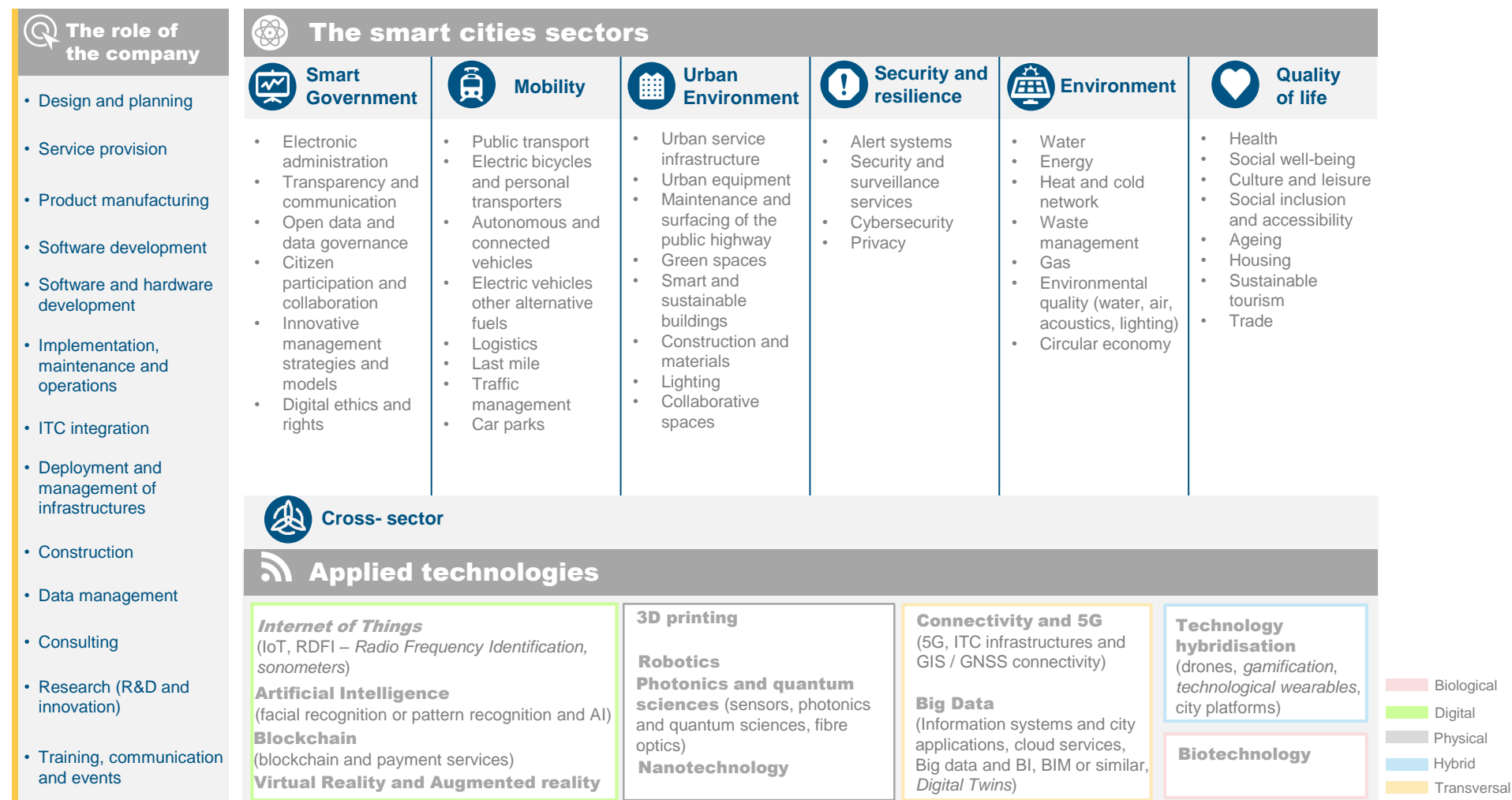


## Exports

- **31%** of the companies have branches abroad
- **46%** of the companies in the sector are **exporters**
- The **main export market**, with **47.5%**, is **Europe**

Source: EIC (DGI-ACCIÓ) based on Orbis

# Value chain of the smart cities sector



Source: EIC (DGI-ACCIÓ)



Note: Sectors sorted by number of companies

Source: EIC (DGI-ACCIÓ) based on data from Orbis

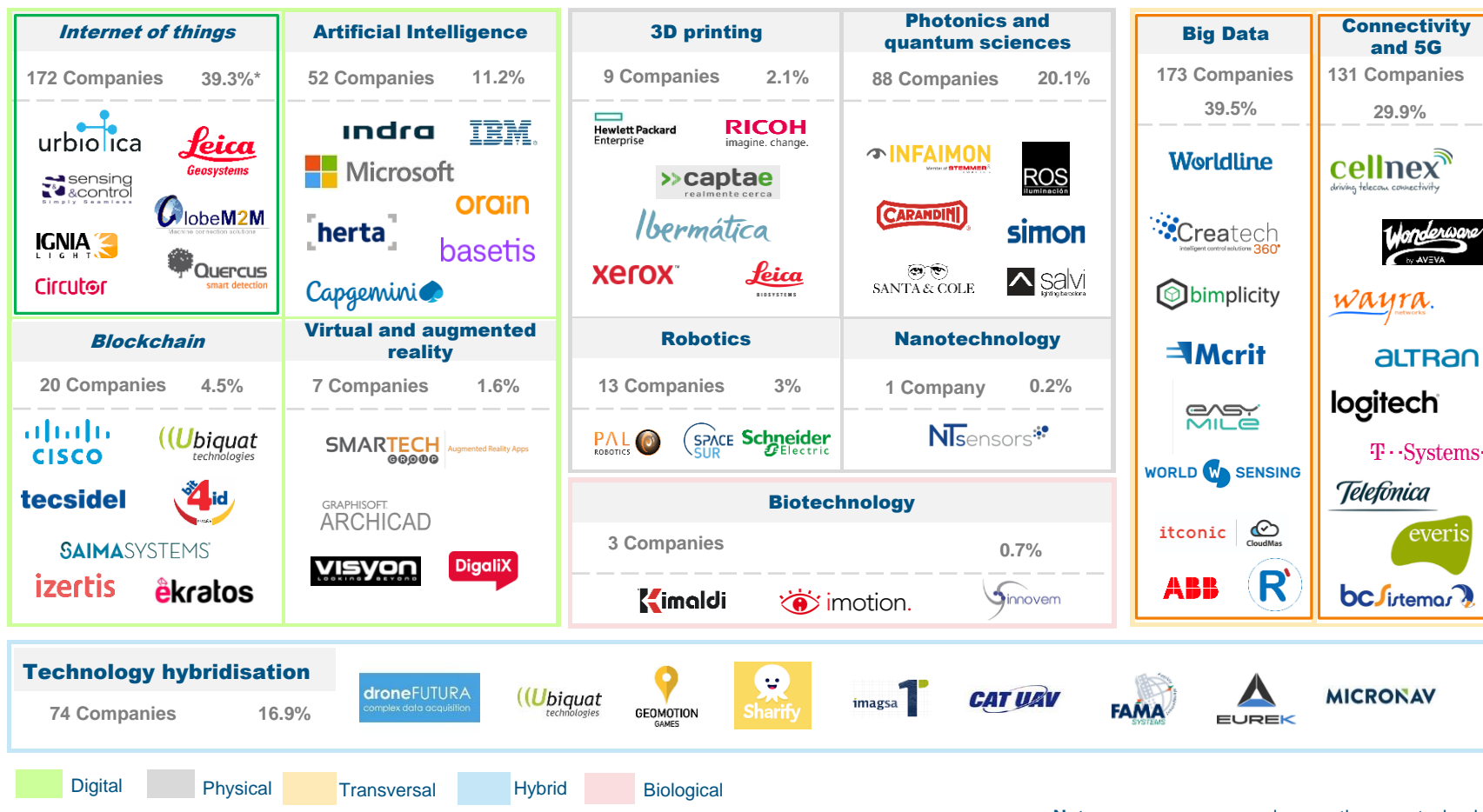
## The role of the company

THE ROLE OF THE COMPANY	Number of companies	% of the total number of companies in the sector	
• Software development	107	24.4%	Worldline tecsided ABS audifilm ScytI CONNECTIN G-SPACE SUR Mcrit TSS TRANSPORT SIMULATION SYSTEMS IMMFLY
• Product manufacturing	97	22.1%	SEAT ABB SACOPA MEDICAL Circutor BENITO -Light PHILIPS Fabregas CAME PARKARE EASY MILE
• Service provision	54	12.3%	Naturgy TMB Transporte Metropolitano de Barcelona cespa urbaser Direct GDF SUEZ Schneider Electric RosRoca suara PROSEGUR Seguridad de confianza
• Consulting	47	10.7%	everis accenture Capgemini Deloitte. PROGRESS alTRAN FLUIDRA nae- Concotel
• Software and hardware development	36	8.2%	IBM RICOH Hewlett Packard Enterprise Microsoft xerox simon Quercus smart detection CAPMAR PAL ROBOTICS HEMAV
• Implementation, maintenance and operations	25	5.7%	Aluvisa CISCO ISTEM Boquet ARELSA COMSA CORPORACION ECOENERGIA Xarxa Ambiental CESVA bc fitemar
• Data management	18	4.1%	WORLD SENSING itconic bismart ALTAMIRA bettair Sensitive Data Datumize innoquant WIRING TECHNOLOGIES, INC. Fintrac
• ITC integration	12	2.7%	INFORMÁTICA OMEGA T-Systems Ibermática ADTEL Intesis akcent cybersecurity ECOENERGIA+ isensing
• Design and planning	12	2.7%	scob arquitectura y paisaje SUMMA INPROSS BAU JORNETLOPPASTOR ARQUITECTES exe.arquitectura land ERV arquitectes associats JANSANA DE LA VILLA DE PAAUW ARCHITECTES SIARQ
• Construction	11	2.5%	FCC COPISA ferrovial GRUP SOLER GLS bdu Atechbcn Bioaccez ROC GELONCH
• Training, communication and events	8	1.8%	Clear Channel JCDecaux VISION ubiqum dotopen TINKERERS MOL
• Deployment and management of infrastructures	7	1.6%	Telefónica indra saba etra cellnex Mier eptisa
• Research (R&D and innovation)	4	0.9%	aeris isardSAT SMART ENGINEERING innovem
	438	100%	

Source: EIC (DGI-ACCIÓ) based on data from Orbis

Note: Roles sorted by number of companies

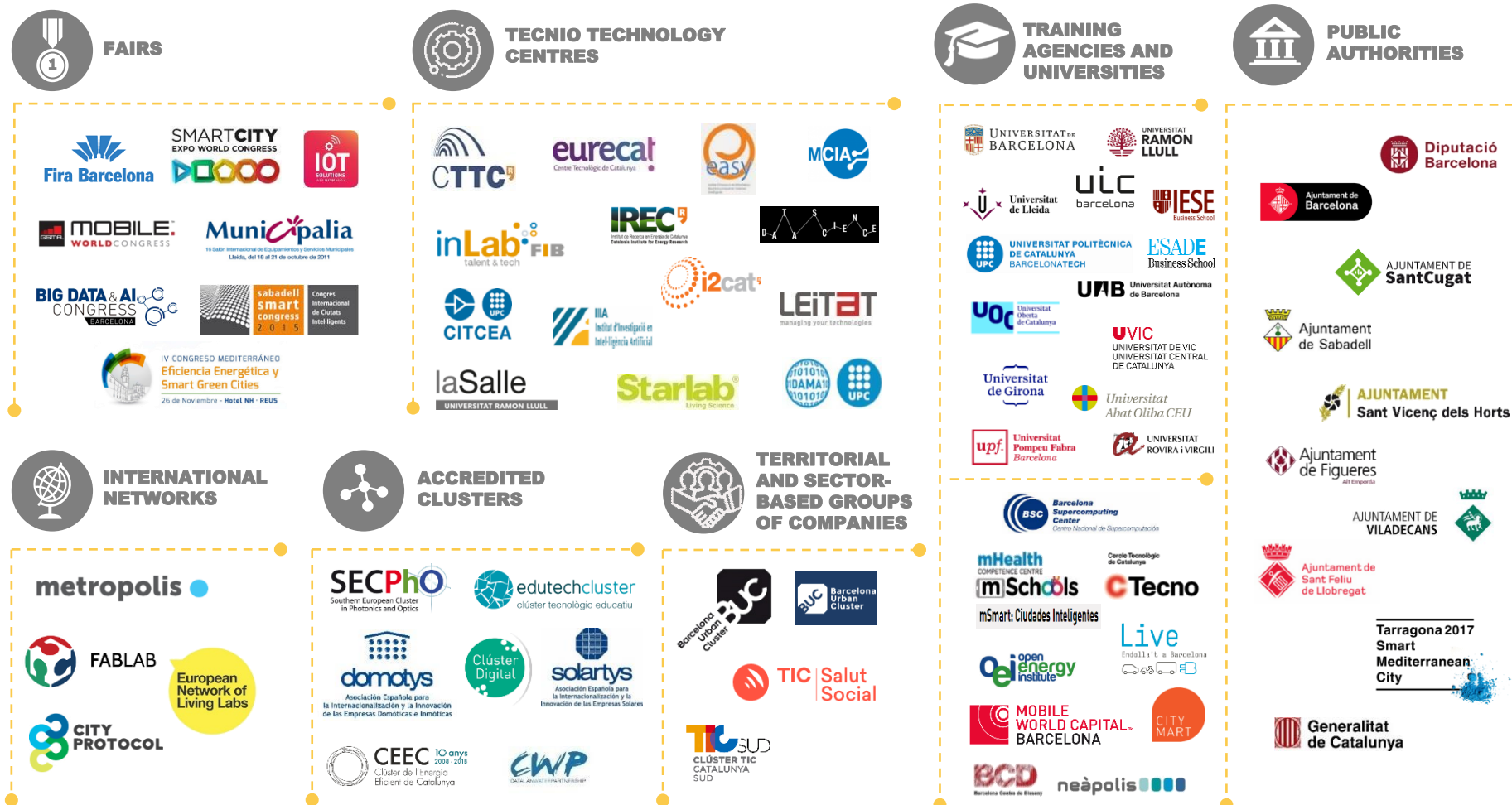
## Applied technologies



**Note:** a company may apply more than one technology

**Source:** EIC (DGI-ACCIÓ) based on data from Orbis

# The Catalan ecosystem supporting the smart cities sector



Source: EIC (DGI-ACCIÓ)

# The Smart City Expo World Congress in Barcelona

The **Smart City Expo World Congress (SCEWC)** provides a unique meeting point for the entire ecosystem of smart cities. Since it began in 2011, it has become a world benchmark event in providing support for the development of cities.

Forecasts for the 2019 edition:

 <b>140</b> COUNTRIES	 <b>25,000</b> VISITORS	 <b>700</b> CITIES
 <b>1,000</b> EXHIBITORS	 <b>400</b> SPEAKERS	 <b>65</b> PARALLEL EVENTS

“The *Smart City Expo World Congress* is such a gathering of cities, governments and corporate partners that, for us, having a large presence establishes Mastercard as an orchestrator in the smart city industry. It's a chance to engage with cities and expose our solutions.”

*Maddie Callis – Director, City Possible  
Mastercard*



Source: Fira de Barcelona

# Technology for smart cities made in Catalonia

## The technology centres in Catalonia applied to smart cities, TECNIO Centres



Source: EIC (DGI – ACCIÓ) based on TECNIO

# The Catalan university system and its commitment to knowledge in smart cities

## Research Groups



**Smart Government UPF** is a project by the Pompeu Fabra University that provides an innovative offering of resources of interest for Public Managers and students in the area of Public Management.



**Smart-Cities UB Chair** is a Research chair at the University of Barcelona that seeks to provide a better understanding of the specific problems of cities and to design initiatives for urban policies that help promote their competitiveness and social cohesion.



The **ESADE Center for Innovation in Cities** is a research group that specialises in city management. It forms part of the *ESADE Institute for Innovation and Knowledge Management*.

12 Universities

687 Master's Degrees

19,600 PhDs

591 Degrees

208,500 University students

14,914 Research staff

Over 50 design schools

## Degrees

The **UAB** is the first Catalan university to offer a degree specialising in smart cities. A 3-year course, the name of the degree is **"Smart and Sustainable City Management"**.

## Master's Degrees



The **UOC** offers a Master's Degree in **"City and Urban Development"** which includes an exclusive module for smart cities



The **UB** has developed its own Master's Degree titled **"Smart City Manager"** in collaboration with the *Zigurat Global Institute of Technology*.



The **UdG** is the first European university to offer a Master's Degree exclusively in smart cities.

Source: EIC (DGI – ACCIÓ)

### 3. Business opportunities



- Internationalisation opportunities
- Business opportunities for the smart cities sector

# Internationalisation opportunities



## UNITED STATES

Smart cities solutions: in terms of the United States, the adopting and implementation of smart city initiatives can be foreseen over the coming 6-10 years, with clear involvement of the private sector. Smart cities as the integration of technology within urban planning. It is estimated that the market will account for 6.5 billion USD in 2020.



## CANADA

Since 2018, the Catalan government has earmarked funds for the development and promotion of smart cities. The "Connect to Innovate" programme plans to invest 500 million CAD before 2021. The trends and the sectors of opportunity are housing, mobility and smart energy storage networks.



## BRAZIL

Smart cities, despite the fact that urban growth in Brazil has been extremely imbalanced, there are good opportunities for smart solutions, especially in large cities. Opportunities have been detected in the areas of public lighting, basic sewerage, waste treatment, urban mobility and ITCs aimed at the electronic administration.



## MOROCCO

The urban population in Morocco is constantly growing and the main cities in the country have to make efforts to adapt and improve their urban equipment. Needs are great in infrastructures, urban equipment and the entire ITC industry applied to the smart management of cities.



## UNITED ARAB EMIRATES

The United Arab Emirates is a country of opportunities for Catalan companies in the area of smart cities. Dubai has created a transformation programme to become one of the smartest cities in the world. The Smart City Dubai initiative seeks to encourage collaboration between the public and private sectors.



## RUSSIA

The city of Moscow is the regional leader in smart technologies and is promoting certain guidelines for urban development in the country. Products of special interest: weather-resistant and thrashing-resistant sensors, new technologies associated to public transport that contain locatable components, security systems, etc.



## BELGIUM

Over the coming years, Belgium is to back a policy to support more sustainable development in its cities. *Smart* not only means more connected, but also more sustainable in terms of inclusion -urban mix, use of renewable energies. Most of the projects are to be implemented using public-private methodology.



## HOLLAND

In Holland, cities are working on becoming smart cities. Amsterdam is an international example of a smart city and founded, along with Barcelona and New York, the cities coalition for digital rights. Companies have opportunities to collaborate in projects in the two countries on an innovation and commercial level.



## SINGAPORE

Since the launch of the Smart Nation Singapore programme (2014), developments in its environment have grown exponentially. Singapore is known as the top smart city in the world. The immediate focus lies on 5 programmes: national digital identity system, e-payments, sensor platform, urban mobility and Moments of life.



## TURKEY

Councils emphasise the concept of smart cities in almost all the new projects related to cities. The opportunities arise in the field of smart applications related to transport, energy and resources, including smart management and control systems.



## JAPAN

With the 2020 Tokyo Olympic Games in sight, Japan is currently rebuilding cities and infrastructures for the future. Opportunities will arise for the materials, products or technologies related to smart cities, with energy efficiency, sustainable mobility, and renewable energies.



Source: World map of international business opportunities, 2019 EIC (DGI – ACCIÓ)

# Business opportunities for the smart cities sector

## Investment opportunities

- Deployment of the network of infrastructures necessary for cities to become smart.
- Maintenance of the deployed infrastructures.
- Opportunities in areas such as:
  - Energy
  - Healthcare
  - Construction of infrastructures
  - Governance

## Increased competitiveness

- Part of the ecosystem of Smart Cities includes a business-friendly environment, including favourable taxation, reduced administrative burden, access to financing, a flexible labour market with skilled workforce and regulations that are supportive of business activity.
- Together with the focus on technology, these aspects will place a strong emphasis on innovation and on research and development (R&D) as main drivers of the city's competitiveness, basing their wealth on knowledge production.

## Cost-saving processes

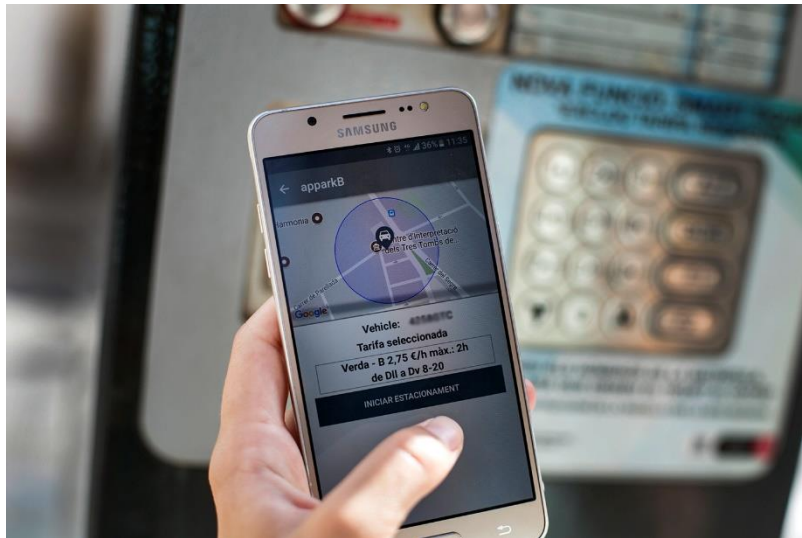
- The deployment of technology, digital networks and telecommunications will allow companies to save on aspects such as transportation and mobility, real estate for both offices and manufacturing plants, and utilities such as energy, water and communications.
- In addition, accessibility to services such as financing, healthcare and training for employees will help businesses in terms of profitability, while keeping the workforce motivated.

## Clusters: new companies and new business models

- Smart Cities' focus on innovation will lead to the development of clusters for business incubation centres and R&D, where companies will be able to benefit from state-of-the-art infrastructure, partnerships with universities and research centres and venture capital funding for start-ups.
- As the city or specific urban districts specialise in certain areas for knowledge generation and wealth creation (e.g. technological, manufacturing, medical), companies will be able to benefit from synergies between cluster stakeholders.

Source: Euromonitor

## 4. Success stories



○ Success stories

# Success stories



eCooltra is the leading scooter sharing service in Europe, with a fleet of more than 5,000 electric scooters and present in 6 cities: Barcelona, Madrid, Valencia, Rome, Milan and Lisbon.

Using an app, users can select the nearest scooter, reserve it, and move around the city. The service enables users to pay only for the minutes the scooter is used and includes insurance, battery, helmets and maintenance.



Cellnex is the main independent European operator of wireless telecommunications infrastructures. In terms of the smart cities sector, it focuses on the area of ITC infrastructures, Innovation and IoT.

The Smart Brain service is noteworthy, guaranteeing access to urban infrastructures through the homogenisation of data collected from different sources.



SIARQ Advanced Solar Design is a company that specialises in the integration of solar energy into urban furniture and forms part of the World Alliance for Efficient Solutions for the Environment.

SOLAR URBAN HUB is worth noting. An integrated energy and information system that combines advanced photovoltaic solar technology with high energy density batteries, LED lighting technology and remote monitoring technology.



Urbiotica is a pioneering IoT company that designs state-of-the-art wireless sensor systems. The smart parking solutions are noteworthy, which improve the experience of car park managers and users.

The solution guides users to the free spaces simply and quickly. Furthermore, it offers much more effective management through greater productivity of the spaces and better control of the use and payment of the car park.



Source: EIC (DGI-ACCIÓ)

# Success stories

orain



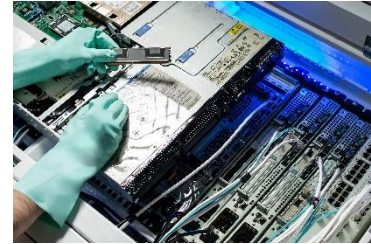
Orain is an IoT network of self-service machines that enables human-machine communication through AI based chat and BI platform. Born as a response to vending market needs for mobile payments, customer service automation and geolocated marketing, Orain became a one stop shop of IoT social payments, including smart fridges, office coffee service's, self-service laundries, parkings, appliances and others.

shotl

Shotl is new-mobility start-ups, which offers transport concept focused on improving transportation for suburban families. Shotl provides a mobility platform that empowers transport operators to supply on-demand bus services by matching multiple passengers headed in the same direction with a moving vehicle.



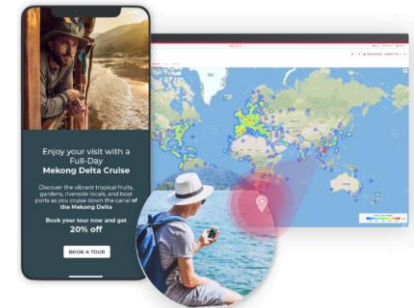
submer



Submer is a cleantech company that designs, builds and installs highly efficient and sustainable Liquid Immersion Cooling (LIC) solutions such for HPC, hyperscaler, datacenters, Edge, AI, deep learning and blockchain applications.

MOCA™

MOCA is a citizen engagement platform supporting governments in easily and quickly converting digital and physical data into actionable insights through hyper-personalized messaging orchestrated across mobile, web and other emerging digital channels in order to act on the needs of citizens and tourists in any place of the world in real-time.



Source: EIC (DGI-ACCIÓ)



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## Take a look at the full report:

<http://catalonia.com/.content/documents/smart-city-in-catalonia.pdf>

## More information about the sector and related news:

<http://catalonia.com/trade-with-catalonia/smart-city.jsp>

