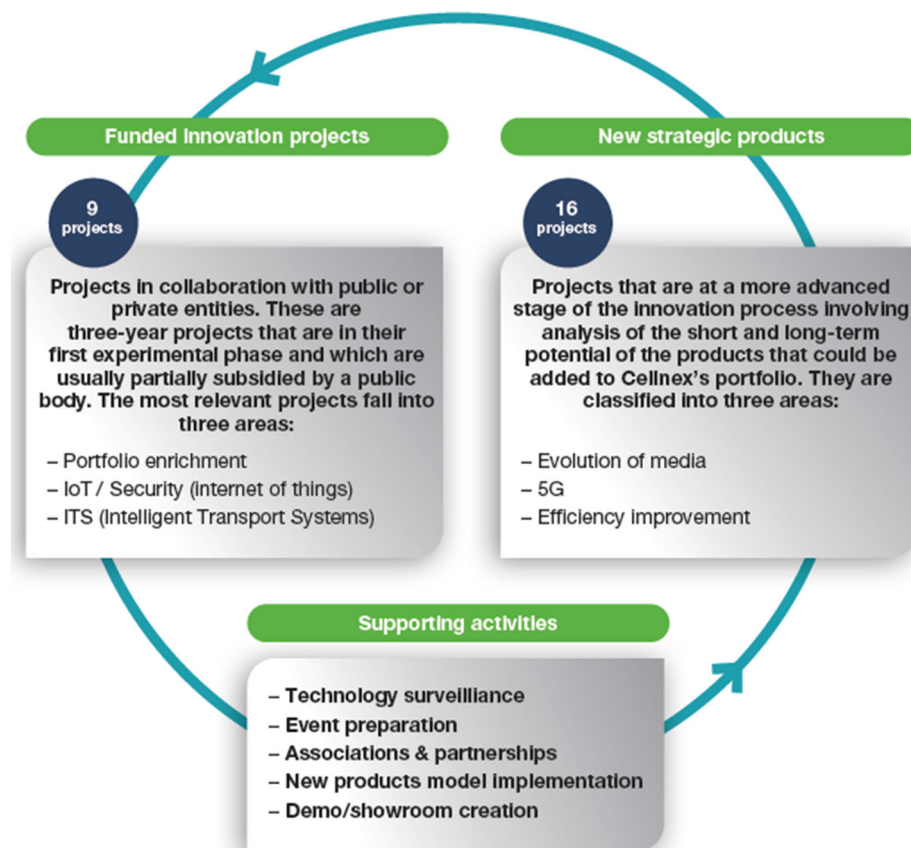


Cellnex's business model
consolidation in
telecommunications sector

An innovative and transformational business

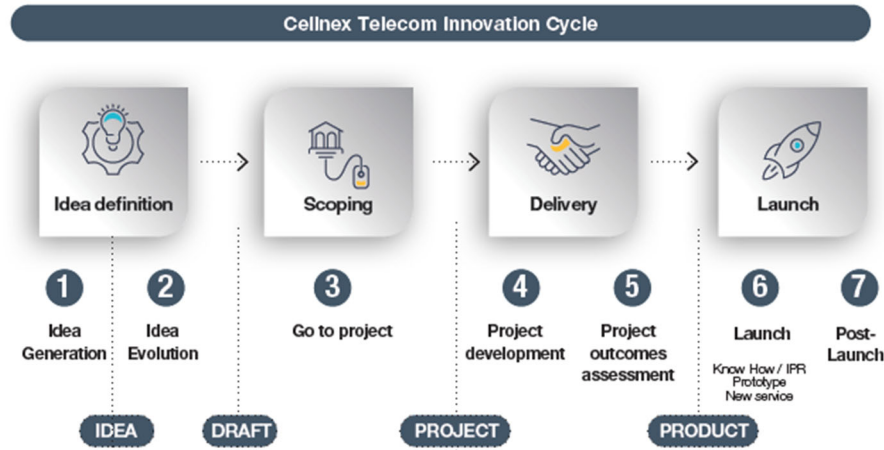
Cellnex's innovation is closely linked to its strategy, and this is embodied in its aim to be the company that generates value for society, customers and shareholders, through innovative, efficient, neutral and high-quality management in delivering service and contributing technological solutions. This commitment to R&D+i represents one of the main drivers for Cellnex in the current global context, characterised by its strong innovative character and being a company that is strongly linked to the digital world and the communication technologies.

In this sense, Cellnex works on different projects to be one step ahead, specifically, in two areas: innovation and product strategy. This model also embodies a cross-cutting approach, where working procedures are defined in multidisciplinary teams and enhanced cooperation with the stakeholders that deal with Cellnex.



Cellnex's business model consolidation in telecommunications sector

Cellnex has an efficient and consolidated Innovation Model based on streamlined integration processes, as well as on standardising the development of innovative activity. This model fosters a culture of innovation throughout the company that encourages everyone to continue working in line with the vision of cross-cutting integration of innovation and work with multidisciplinary teams, both inside and outside the company.



Open innovation

Cellnex is driving open innovation, allowing the company to deal with companies with a wide variety of verticals, nature or size. In this sense, the company is developing different initiatives:

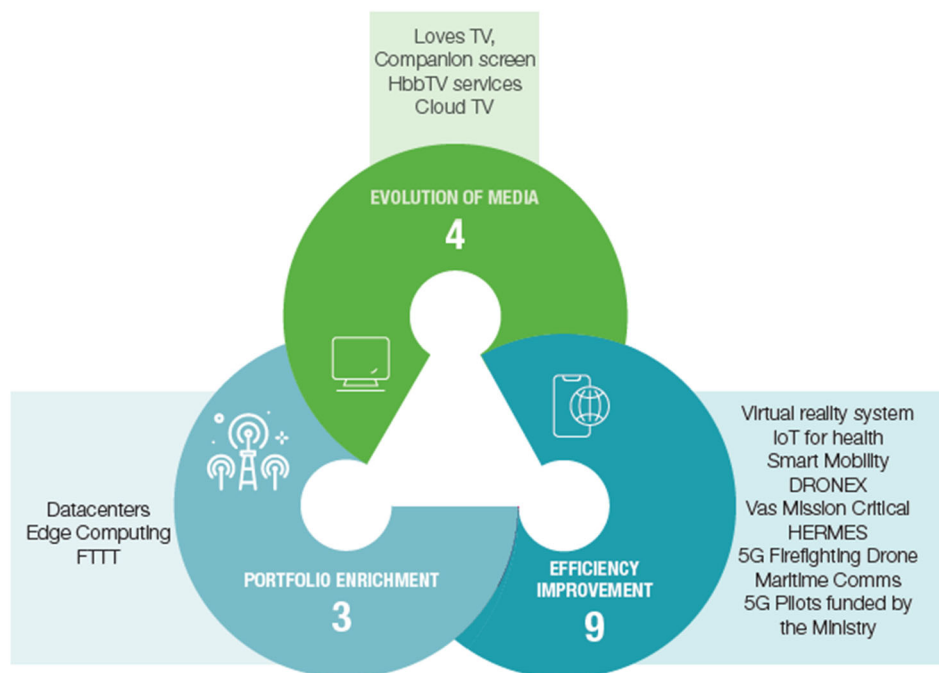


Cellnex's business model consolidation in telecommunications sector

- **Acquisition:** we evaluate potential acquisitions of start-ups related to Cellnex business.
- **Investment:** Cellnex is dedicating time to identify investment opportunities with Start-ups. At this point, the project with the start-up Nearby Computing stands out.
- **Acceleration:** we collaborate with third party acceleration programs in order to get a faster evaluation of a potential opportunity with a startup.
- **Co-Innovation:** A lot of activity around Open Innovation is through collaboration with external companies in a variety of verticals
- **Discovery/Scouting:** We do usual start-up ecosystem surveillance, attend to start ups events and collaborate with seed funding companies among other activities in order to detect potential opportunities.

R&D+I projects developed in 2019

New strategic products




Cellnex's business model consolidation in telecommunications sector

Evolution of Media

EVOLUTION OF MEDIA

LOVESTV

- Second phase of the streaming platform which includes personalized area (MyLOVESTv), multiscreen and targeted advertising as key new features.
- *Companion Screen: Integrate in one unique piece of software the companion screen capabilities from all different TV manufacturer's, as per Hbbtv specification.
- *HbbTV services: Develop a tool to help and stimulate the media ecosystem to create new Hbbtv applications involving easily broadcasters, producers and media agencies



Portfolio enrichment

Portfolio enrichment

Datacenters

- Leverage on the Alticom DataCenter knowledge to create a model for all the Cellnex Countries, based on IaaS, PaaS or SaaS.

Edge computing

- Productize edge computing functionality and offer it to potential clients

FTTT

- Connectivity solution using optic fiber to interconnect Cellnex towers (FTTT) to become 5G ready and to resell the solution to MNOs.

Cellnex's business model consolidation in telecommunications sector

Vertical projects

Verticals

Virtual reality system

- Virtual reality project at the Cruilla Festival: those attending the festival were able to experience musical interpretation immersed in a 360° live virtual reality. The main stage concerts were broadcast live to Cruilla Village. There, visitors can use the virtual reality glasses to get a 360° immersive projection of everything that happens on and around the stage during a performance (with Acciona and MasMovil partners).



IoT for Health

- Agreement with Hospital Clinic to carry out a project to monitor non-critical patients using low-cost IoT sensors over a 5G network (initially the tests will be carried out using the Sigfox network). For optimum use in hospitals, these IoT sensors will adhere to the patient using a patch that will allow, among other things, the measurement of surface temperature



ITS Italy

- Project in Italy creates an experimental environment in the field of mobility for intelligent cities. Specifically, Cellnex's contribution to the project has consisted in the implementation of a solution that improves Urban Mobility, through the monitoring of the access and exit of vehicles to the enclosure and the management of several parking areas.



DRONEX

- Development of a Drone-based inspection service for Infrastructures



Cellnex's business model
consolidation in
telecommunications sector

Verticals (cont.)

5G Firefighting Drone

- This pilot belongs to the security and emergency sector, and its scope of application was in Barcelona at the 'Barcelona Drone Center' aerodrome. It consists of the use of drones with temperature sensors and high resolution camera for the management of fire extinction and control of the extinct perimeter.



Maritime Comms

- Implementation of a commercial implementation of vDES maritime comms . protocol and associated services for security and fishing legal control.



VAS Mission Critical

- Open Innovation initiative to include Third party applications as part of the Mission Critical Value Proposal. The target is to add services with the infrastructure.



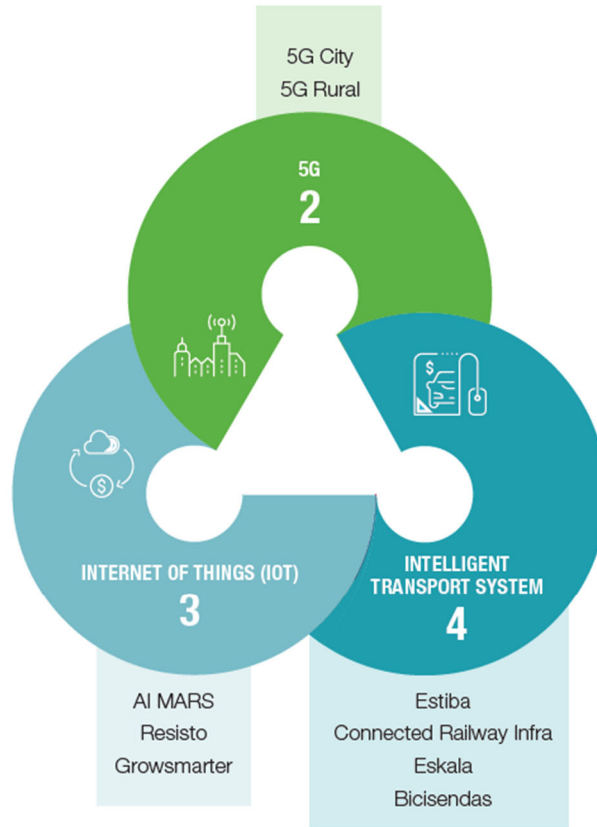
5G Pilots funded by the Ministry

- Cellnex has collaborated with mobile operators on four specific projects for the development of four government-funded projects:
 - 5G energy study
 - Fixed Wireless Access
 - Crowd Security
 - Autonomous Harvesting



Cellnex's business model consolidation in telecommunications sector

Funded innovations projects



5G projects






5G City	5G rural
<ul style="list-style-type: none"> The objective of the project is the deployment of a common 5G network, open and multi-operator that extends the centralized model in the cloud to the edge of the network. 	<ul style="list-style-type: none"> The project explores the various possibilities for deploying a 5G network in selected rural areas in an economically viable manner.

Cellnex's business model consolidation in telecommunications sector


Internet of Things (IoT)/ Security

Internet of Things (IoT)

<div style="background-color: #008080; color: white; padding: 5px; text-align: center; border-radius: 10px; margin-bottom: 10px;"> AI MARS </div> <ul style="list-style-type: none"> Project in collaboration with the Spanish military police, aiming to investigate technologies and methodologies to support surveillance and prevention of incidents in areas with high concentration of people 	<div style="background-color: #008080; color: white; padding: 5px; text-align: center; border-radius: 10px; margin-bottom: 10px;"> Resisto </div> <ul style="list-style-type: none"> Cybersecurity and physical security project for critical infrastructures such as the Coixerola Tower, Torrespaña, seaport, etc. 	<div style="background-color: #008080; color: white; padding: 5px; text-align: center; border-radius: 10px; margin-bottom: 10px;"> Growsmarter </div> <ul style="list-style-type: none"> This is an evolution of the Smartbrain platform with applications and sensors for services that improve the quality of life of city dwellers, as well as reducing the environmental footprint. 
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Intelligent Transport System

Intelligent Transport System

<div style="background-color: #008080; color: white; padding: 5px; text-align: center; border-radius: 10px; margin-bottom: 10px;"> Estiba </div> <ul style="list-style-type: none"> Development of i4.0 technologies for the digitalization of Spanish ports by means of highly automated logistics (autonomous cars and cranes from the installation of sensors in the containers). 	<div style="background-color: #008080; color: white; padding: 5px; text-align: center; border-radius: 10px; margin-bottom: 10px;"> Connected Railway Infra </div> <ul style="list-style-type: none"> This Project focuses on rail networks, maintenance and repair. In order to achieve this objective, Sigfox technology is being applied and ADIF is participating in the project. 	<div style="background-color: #008080; color: white; padding: 5px; text-align: center; border-radius: 10px; margin-bottom: 10px;"> ESKALA </div> <ul style="list-style-type: none"> Integrate airport processes and actors to offer a new concept of global operation, providing the airport control center with artificial intelligence to minimize stopover time. 
<div style="background-color: #008080; color: white; padding: 5px; text-align: center; border-radius: 10px; margin-bottom: 10px;"> BICISENDAS </div> <ul style="list-style-type: none"> The objective of the project is the development of innovative cycle lanes that include new construction processes and the integration of digital communications to improve the environment and increase comfort and safety in the vicinity of the cycle lane. Within the activities of the project, Cellnex will focus on the development of a communications infrastructure that ensures the proper management and use of the information collected in the bike lane. To this end, the use of 5G as a technology for communication between vehicles and infrastructure is evaluated. 		

Cellnex's business model
consolidation in
telecommunications sector

Opportunities for 2020 and long-term innovation strategy

5G projects

5G projects



Datacenters

- Expansion of the Data Centers product in Cellnex footprint countries where this product is not established on the basis of Alticom's experience in the Netherlands.



MEC

- Multi-Access Edge Computing (MEC) product development. The MEC is a key element in new communications networks that brings computing power and storage to the edge of the network by drastically reducing traffic to the core of operators and drastically reducing latency in communications. This element combined with the new generation 5G networks enables an enormous amount of new services unthinkable until now, such as Virtual Reality, the Autonomous Car or the automation of industrial operations.

Efficiency Improvement

Efficiency Improvement



5G Energy Study

- 5G energy efficiency study. Given the increase in energy consumption that 5G technology represents compared to 4G, it is proposed that solutions be sought to minimise this impact through the application of different technologies.



Edge/OpenRAN

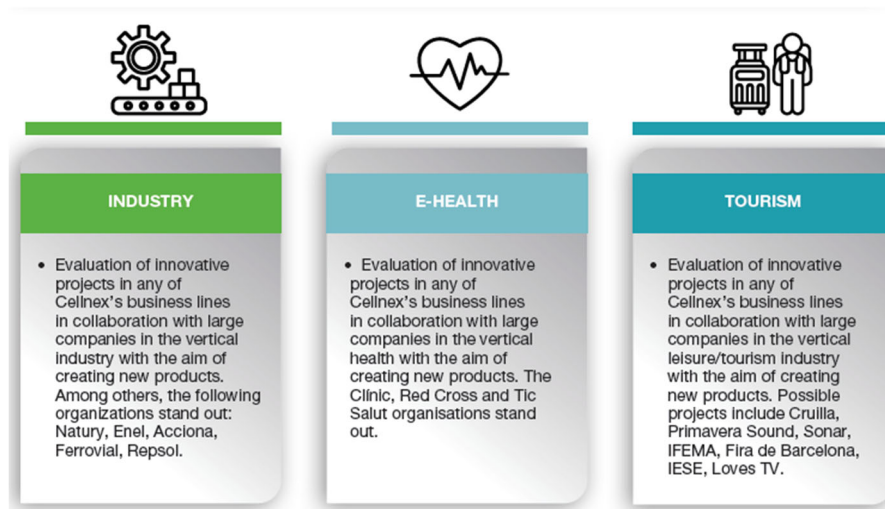
- Projects focused on the testing and evaluation of new radio access technologies (OpenRAN, C-RAN...) and Edge computing with operators and OTT (Over-The-Top) companies.



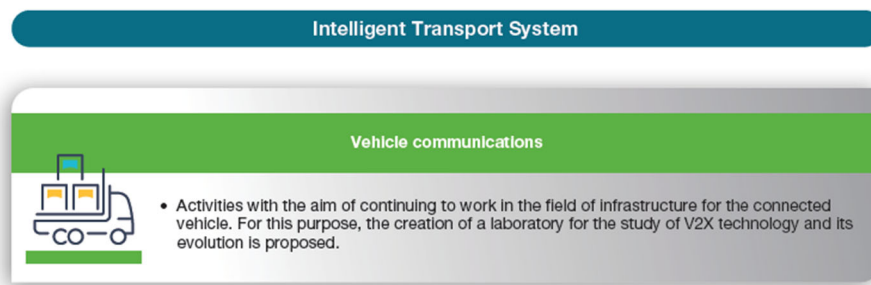
DAS ENABLER

- Exploring how the combination of DAS (Distributed Antenna System) and MEC (multi-Access Edge Computing) densification technology in football stadiums opens the door to a new generation of services that will increase the demand for these network infrastructures by facility owners. Possible projects with Atlético de Madrid, Barcelona or Real Madrid stadiums stand out.

Cellnex's business model consolidation in telecommunications sector



Intelligent Transport System



Supporting activities

