

PRESS RELEASE

Madrid, October 29, 2015

TELEFÓNICA AND IMDEA NETWORKS ANNOUNCE OPENING OF 5TONIC: SPAIN'S FIRST LABORATORY OF 5G EXCELLENCE

- **The 5TONIC laboratory: developed by experts from Telefónica and IMDEA Networks with the purpose of creating an open ecosystem for innovation and investigation**
- **A place where industry and the academic world can work together to further the development of 5G technologies and their entrepreneurial ecosystem is set to open November 2015 at IMDEA Networks headquarters in the Leganés area of Madrid**
- **With its involvement of this new center, Telefónica, also a founding partner of the 5G Innovation Centre at the University of Surrey, redoubles commitment to the development of new 5G technologies.**
- **Ericsson is the first manufacturer to join the initiative as part of its 5G for Europe program.**

Madrid, October 29, 2015.- Telefónica and IMDEA Networks have announced today the creation of the first laboratory of 5G excellence in Spain. The center, called 5TONIC, was developed with the purpose of creating an open ecosystem for innovation and investigation as well as to provide a place where industry and the academic world can work together on furthering the development of 5G technologies and their entrepreneurial ecosystem.

The laboratory will be located at the central office of IMDEA Networks on the outskirts of Madrid and will include buildings strategically located in select areas to allow testing of the different technologies studies. The center will open its doors next November and will operate at least until the first 5G products are commercially viable, which is expected to happen approximately in 2020. Telefónica is also a founding partner of the 5G Innovation Centre of the University of Surrey and now through its involvement in the development of 5TONIC aims to re-double its commitment to 5G excellence.

Pragmatic focus based on viability studies

This is the first excellence center of its kind in Spain, aimed at investigation and innovation, as well as the performance of field tests and demonstrations of all the technologies and equipment which will make up 5G communications, including its services and applications.

It is also the first laboratory in Europe that proposes taking on such investigative processes from an eminently practical point of view. Thus, the center will encourage an adequate environment so that Telefónica and other interested companies – for instance, Ericsson has already joined this initiative – can carry out viability tests of a specific technology, determining hidden deployment costs, and analyzing all aspects of the system as well as the complexity of all the different solutions. In this sense, the laboratory will

allow different sector players interested in conducting realistic analysis of not only the technologies that could graduate to 5G, but also on accelerating innovations needed in network architecture to enable cases of use and applications from multiple industrial sectors.

5TONIC will comprise two main areas. Firstly a unit dealing with virtualization software for 5G networks (5G Virtual Software Network), that will be centered on the virtualization of network functions (NFV); software defined networking (SDN); security services, network control and management planes; cloud services and signaling services. The second unit will look at the 5G wireless systems area (5G Wireless Systems) focused on the air interface, radio aspects, duplexing, multiplexing, media access control, spectrum, interference, mobility tracking and all based on a multi-RAT approach.

Even though 5G networks are still in an initial phase of development, the consensus of sector experts estimates that the next mobile generation will considerably improve latency, the transportation of volumes of data will be 1,000 times greater than currently, will allow for the increase of the number of devices simultaneously connected between 10 and 100 times, and increase the life span of batteries up to 10 times, among others. Cases of future use such as the remote control of robots or the interconnection of sensors, plus the demands of mobile clients of the futures, shall require super-fast and top quality connections with latency levels practically nil.

Currently, efforts by operators, regulators, manufacturers, and other actors present in the ecosystem are focused on cooperating in defining the requirements and cases of use of the system; in other words, the new application scenarios that 5G must enable and identify the network technologies and designs that will allow them to do so.

Quote from Enrique Blanco, Telefónica Global CTO

"The opening of this center is a step forward for Telefónica which has been actively participating in a wide spectrum of international projects, industrial associations, and standardization of 5G technologies organisms. The center of 5G excellence in Madrid will allow us to test, choose, and prioritize the functionalities of the candidate networks and services that will be part of future 5G networks, in order for the resulting system to be consistent and coherent. We don't want the 5G networks start-up to be a specific single event, but rather a process which we want to begin right now".

Quote from Arturo Azcorra, Director of IMDEA Networks

"5TONIC is essential for the development of scientific and technological solutions so that Spain does not get left behind the 5G networks train. Through 5TONIC and IMDEA Networks we wish to consolidate a Singular Scientific Initiative that openly combines the efforts of public and private R+D efforts in the Science of Networks. Through AMETIC, the ITC sector, as well as leading companies like Telefónica and Ericsson are willing to participate in this initiative which is a leader on a European level".

Quote from José Antonio López, Board Member, Ericsson España

"5G is the evolution of the mobile communications and it will be instrumental to tend to the needs of the connected society and to make the digital transformation of the rest of the industries a reality with the possibility of attending multiple new cases of use. Ericsson actively participates in European and international programs for the investigation and development of 5G such as Horizon2020, 5GPPP, or METIS II which we lead. Our alliance with Telefónica and IMDEA Networks for 5TONIC within the framework of our 5G

for Europe program will contribute so that Spanish industries and society in general enjoy the benefits of 5G in the near future”.

About Telefónica

Telefónica is one of the largest telecommunications companies of the world in terms of stock market capitalization and number of clients. Based on the best fixed land-line, mobile, and broad band networks, as well as an innovative offer of digital services, the Company is transforming into a “Digital Telco” positioning it very favorably in order to satisfy the needs of its clients, and to capture growth in new incomes. Present in 21 countries with a client base of 329 million accesses, Telefónica has a strong presence in Spain, Europe, and Latin America where it concentrates the majority of its growth strategy.

About IMDEA Networks

IMDEA Networks Institute is a networks institute whose multinational team works on vanguard fundamental science. As a growing and English speaking institute based in Madrid, Spain, IMDEA Networks offers a unique opportunity to pioneering scientists that aspire to develop their ideas. IMDEA Networks is establishing itself internationally as head in the development of future network technologies and has already incorporated scientists with renowned reputations.

Our researches will contribute to determine the future of network science during the next few years, always with the goal of creating better technologies that benefit society in several aspects of life, guaranteeing a socioeconomic impact based on its unbeatable research in the field of networks.

About Ericsson

Ericsson is the driver of the Network Society – world leader in communications technology and services. Our long term relationship with the majority of telecommunications operators around the world allows people, companies, and societies to live up to their potential and to create a more sustainable future.