5G and fibre: Present and future

Juan Manuel Pérez Cortijo, EMEA marketing director, Corning Optical Communications, says the more revolutionary aspects of 5G capability will need higher frequency bands and since these signals are more fragile, it will need many more antennae than existing macrocell sites can support, and these will all be driven by fibre.

CORNING SCIENTISTS DR. Robert Maurer, Dr. Donald Keck, and Dr. Peter Schultz were brought together more than 50 years ago to develop a highly pure optical glass that could effectively transmit light signals over long distances – a feat that had never been achieved. The very best bulk optical glasses of the day had attenuations of around 1,000 dB/km. This meant the scientists had to see an improvement in transparency of 1,098 in order to reach the 20 dB/km goal. The task seemed impossible, but their successful technological breakthrough forever changed the world.

An early breakthrough

This year, Corning Incorporated celebrates the 50th anniversary of the company's world-changing invention of low-loss optical fibre, and since then, has delivered more than a billion fibre kilometres and operates several optical fibre plants globally. The breakthrough material, each strand thinner than a human hair, made possible today's ever-faster telecommunications networks that link neighbourhoods, connect cities, and bridge continents.

The term 5G has entered into the mainstream vocabulary, but we should remember that 5G would not be possible without fibre. 5G means faster speeds but also enables wider coverage, higher levels of network reliability and lower latency and the ability to connect billions of devices, most of which won't be mobile handsets. It is only when all these attributes are combined that we can truly realise the full promise of Internet of Things (IoT) and the futuristic world of applications.

Unlocking full potential

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Photo Credit: Corning

Juan Manuel Pérez Cortijo, EMEA marketing director, Corning Optical Communications.

One way to increase coverage/bandwidth capacity for a mobile network is to "densify" it by adding more sectors, meaning deploying more cells. This way, the number of subscribers connecting to a given cell and therefore sharing the available bandwidth is reduced, so that more bandwidth can be allocated to each subscriber per cell.

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In countries where the density of cells prior 5G deployment is good, mobile operators will only have to add the new 5G radios to the existing sites. 5G technology will also operate at higher frequencies in the millimeter-wave band, as there is plenty of spectrum available allowing wider channel bandwidth, highest peak rates and a lot smaller form-factor antennas.

But a key factor is that every new wireless site needs both data and power, and provision of this connectivity is probably the biggest cost element in network densification. It is therefore inevitable that mobile operators will avoid this investment until the nature of the services provided over the 5G network demands it.

The best is yet to come

It is impossible to predict how the capability of 5G technology will benefit us all in the future. The early 5G deployments are only scratching the surface of the full capability of 5G. There is significant investment being made now in large scale fibre-to-the-home (FTTH) deployments throughout MENA and there is enormous potential to make that investment go further by realising the potential of FTTH / 5G Network Convergence. It is a critical time in the lifecycle of fibre deployment, and correct decisions today will reward us long into the future. ■

This year, Corning celebrates the 50th anniversary of the invention of low-loss optical fibre — an innovation that has transformed the way we connect and that lies at the cornerstone of the communications revolution.