



**MNOs choices in 5G;  
Slash costs or die  
5G evolution and deployment forecast 2017-2025**



**A report from RAN Research  
Part of Rethink Technology Research**

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## **Key Findings**

This report analyzes the objectives, timelines and barriers which MNOs see to implementing 5G strategies in the period to 2025, based on a survey of over 100 senior executives within Tier 1 and Tier 2 operating companies, combined with in-depth interviews with a selection of those executives, and with key vendors, standards and open source organizations, and R&D efforts in this field.

Key themes which emerge from this comprehensive research include:

**Different capex and deployment patterns will be seen, from those of 3G and 4G**

5G will follow a very different pattern to that of 3G and 4G in terms of architecture and regional patterns. It will not be a capex windfall for the vendors – operators will prioritise coexistence with 4G and a architecture to prolong the life of existing investments.

There will be heavier reliance on outsourcing and on open platforms to reduce cost and transfer cost further than ever from capex to opex. Operators will spread their investment over a decade and will look to spend as little as half the capex on 5G roll-out that they did on 4G.

**New architectures will lay the foundations for 5G, but will also be accelerated by its requirements**

New network architectures like virtualized RAN and hyper-densification, as well as site improvements like Massive MIMO antenna arrays, will begin to be adopted by some operators in order to extend the life and performance of 4G networks. Common interfaces and platforms will be essential so that these investments will support a migration to 5G, and long term coexistence of 4G and 5G, to enhance the return on investment in both.

The requirements of 5G will accelerate the move towards the new architectures and 5G standards will enable operators to go to greater lengths in terms of virtualization, densification and automation. These three will be essential to transform the cost of carrying the rise in mobile data traffic, and to support new use cases as well as network-as-a-platform approaches including network slicing.

Some high profile operators will go macro-first with 5G, especially among the very early adopters, which see 5G as a medium term replacement for 4G. But many will use the new radios to densify selectively while retaining 4G, for many years, as the primary wide area network. Coexistence between the two will therefore be critical, and a common architecture that supports many radios and spectrum bands, including evolutions of the 802.11/WiFi standards.

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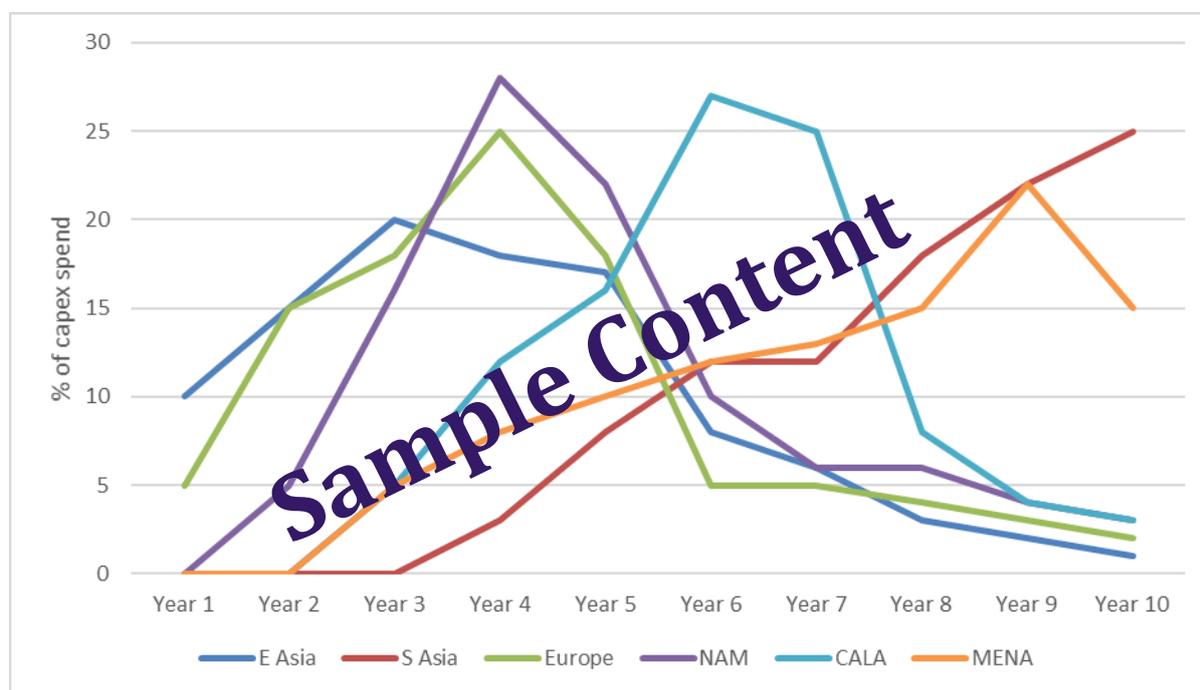
### Capex patterns

There will be heavier reliance on outsourcing of networks and service platforms to make costs more predictable and shift the balance further than ever from capex to opex. There will also be rising interest in open, and even open source, equipment and platforms to reduce cost and introduce new levels of competition and interoperability into the supply chain. And the shift towards software-defined networks and away from proprietary hardware will accelerate, further transforming the cost base.

Operators will spread their investment over a decade and will look to spend as little as half the capex on 5G roll-out that they did on 4G. Figures 1 and 2 show the contrast between the patterns of RAN capex investment in the first 10 years of 3G and 4G deployment, and the predicted pattern for 5G from 2019 to 2029. In 4G, and even more clearly in 3G, each region experienced a period of a few years of concentrated investment, creating a very choppy pattern of capex spending.

However, there were significant regional differences in the timing of those periods of intensive deployment (most notably, China and India moved later than most other major economies, but then spent very intensively, creating a belated boost for vendors).

Figure 1: Distribution of total RAN capex investment in first 10 years of 4G deployment 2009-2019 (Source: Rethink data, operator and regulator filings)



In 5G, the indications from most MNOs are that they will take a more gradual approach and will place greater emphasis on preserving investments in 4G and pro

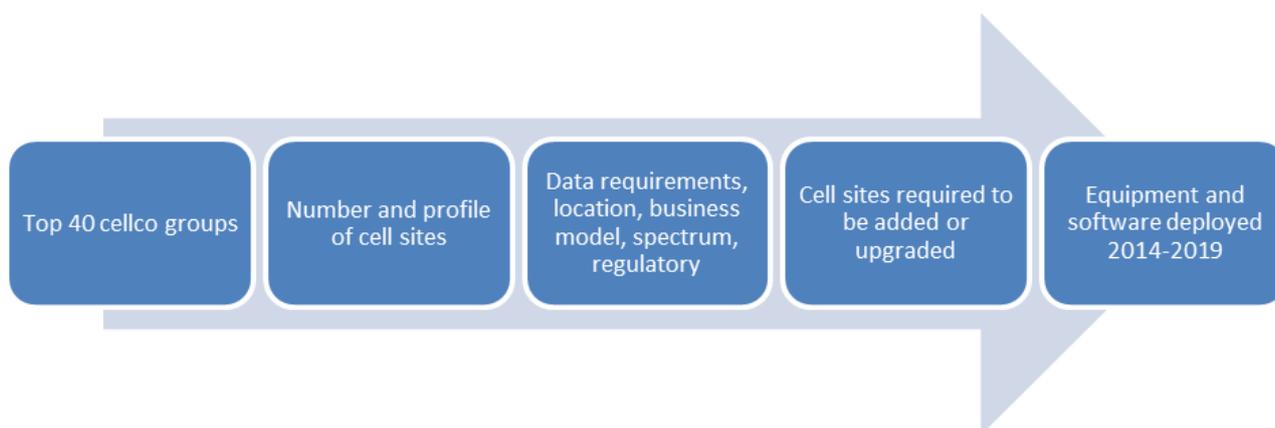
## MNOs choices in 5G; Slash costs or die

### Methodology

The wireless forecast included in this report is based on research on the top 40 international mobile operator groups, which account for 80% of the global mobile subscribers (IMG-40). From this representative group of operators, the macrocell and metrocell forecasts are developed.

From the starting point of a calculation of the number of cell sites already deployed worldwide, forecasts were made of the numbers of base stations that would be rolled out a) to brand new sites and b) to replace or upgrade existing sites. These deployment forecasts were then categorized by network topology, spectrum band, spectrum mode, region and other factors. The equipment deployed in each case was also surveyed and modeled.

### The Rethink RAN Research process summarized



These forecasts were based on a combination of data from:

Detailed surveys, interviews and operator-by-operator modeling of the IMG-40 groups. Studies of the deployments and strategies of the top 100 4G operators, as tracked by Rethink Technology Research's quarterly surveys, interviews and desk research.

A survey of 101 Tier 1 and 2 operators about their detailed plans for RAN deployments to 2020.

Input from ecosystem vendors on shipments, technology strategies and competitive landscape, also updated quarterly.

Based on the surveys of operators and vendors, it was then calculated how those cell sites would be equipped – by base station type, technology, frequency band etc, leading to a detailed unit and market size measurement.

## RAN Research from Rethink

### Who should buy this report

This report is critical to anyone involved in network planning or long term technology strategy for cellular networks, as well as partners, implementers, equipment suppliers, software providers and investors, at C Suite level down to product marketing and product planning. The RAN Research arm of Rethink Technology Research is essential reading for anyone who wants to stay on top of current trends and thinking among tier 1 and tier 2 MNOs across the globe. It's like being a fly on the wall in one of their planning meetings.

### Pricing

Each module of RAN Research costs \$2,000 for a single, individual license, and \$4,000 for a corporate license for any one module. This is the same price for this module, but also for previous or future modules on Hetnet, Small Cells, Cloud RAN, SON and enterprise small cells. RAN Research has been delivering RAN forecasts for 10 years and was the first research company in the world to introduce a small cell forecast, which it has done every year since 2011. A discount for a FULL corporate subscription to include all modules for a year, is available from Simon Thompson, head of subscription sales ([simon@rethinkresearch.biz](mailto:simon@rethinkresearch.biz)).

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## **MNOs choices in 5G; Slash costs or die**

### **About Rethink Technology Research**

Rethink is a thought leader in quadruple play and emerging wireless technologies. It offers consulting, advisory services, research papers, plus two weekly research services; **Wireless Watch** which has become a major influence among leading wireless operators and equipment makers, and has recently introduced **RAN Research**, a parallel research stream forecasting all aspects of cellular RAN Equipment shipments; and **Faultline**, which tracks disruption in the video eco-system, which has become required reading for anyone operating in and around quad and triple play services and digital media. Rethink TV is **Rethink TV** a modular service which allows you to explore the recent roadmap of OTT technology at any operator in the world, one at a time, a country at a time or a continent at a time.

**RAN Research** derives from a broad research base of over 140 service providers (MNOs, telcos, cable and satellite operators, over-the-top providers) worldwide. These organizations are surveyed on a regular basis about their network infrastructure and business plans, and have a relationship of trust with Rethink.

Rethink also has deep relationships with the telecoms ecosystem (tier one device OEMs, vendors, technology developers, integrators, regulators etc), and is perceived as a thought leader in many areas of the telecoms and media sectors. Key areas of expertise and research experience include HetNet migration, small cells and carrier WiFi; transformation strategies for the RAN and the BSS/OSS; convergence of IT and network skills and platforms; device and chipset roadmaps; spectrum strategy.

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