Chapter 9
Potential Scenarios and Drivers of the 4G Evolution

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ABSTRACT

Nowadays, the mobile Internet communications can play a significant role in the Telecommunications Sector, resolving certain issues and bottlenecks of personal communications, with most European countries close to 100% penetration and a global projection of 4 billion mobile users by 2011. As we are moving to the next generation, we are still lacking the precise definition of the architecture and the successful deployment path of the 4G technology. Several theories have been developed looking at different standards and aiming to select and develop the most promising one. In this paper the authors are introducing and presenting a study that aims to explain a new concept of "4G readiness" revealing long run national strategies for 4G deployment and suggesting some critical metrics that could describe the future of the mobile broadband environment. They describe the methodology, assumptions and discuss the expected results based on similar studies such as the e-readiness study.

INTRODUCTION

In a world of increasing technological needs, the mobile Internet can play a significant role, meeting user's capacity and connectivity needs. There is a good deal of research around the 4G concept, where vendors and operators are trying to define it based on their preferred technology and strategic planning.

At the end of 2007, the global mobile subscribers reached 3 billion, with GSM based users accounting for over 2 billion. Several research reports have been predicting that WiMAX will be commercially deployed by 2009 and LTE (Long Term Evolution) by 2011. However, the debate on the standards for 4G continues and is a major concern. International Telecommunications Union (ITU), Institute of Electrical and Electronics Engineers (IEEE) and other similar associations and committees are

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working on securing a smooth transition to the new technology.

The 4G evolution as described in Figure 1, started in early 1990s transitioning into different stages, such 3.5G and 3.75G, ending to the 4G, meeting the market needs in most of the cases. The most recent transition that is expected is the migration from High Speed Packet Access (HSPA) to the 4G standard, which could be the WiMAX or the LTE or the combination of both.

In order to describe the market needs and behavior towards the 4G evolution, it deemed necessary to assess several countries' current readiness to deploy the 4G technology. Supporting the opinion that the LTE evolution will be the winning 4G, we have defined several metrics from different perspectives such as technology, business, and consumer spending to rank each market's 4G readiness in 16 countries. Our main objective is to use a ranking approach to shed light into the factors that are driving countries' progress in deployment of 4G, be able to estimate the deployment speed, and create future scenarios. We create three groups of countries 'established leaders', 'rapid adopters' and 'late entrants'. We also want to be able to compare 4G readiness results with existing similar studies for the same countries to provide observations and derive useful conclusions.

BACKGROUND

Currently, there is no formal definition for 4G. It is a term used to describe the next step in the evolution of wireless communication. Several terms are also describing the concept, such as "Super 3G" (Seizo & Nakamura 2007) or "Next Generation Wireless". ITU has been committed to announce a 4G definition. There is general agreement among experts that 4G is a new converged system that will provide at least 100Mbps connectivity to the broadband users. 4G is expected to offer data rates of 100 Mbps for mobile applications and 1 Gbps for nomadic applications and should be achievable between the years 2010 and 2011.

The current defined objectives for 4G include (Etoh 2005; Fratassi, et.al., 2006; Mohr 2008; Dursch, et.al., 2005):

- Fully integrated IP solution
- "Anytime, Anywhere"
- Seamless connectivity- wireless and wireline

Figure 1. 4G evolution into convergence (Adapted from Etoh, 2005)