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ZTE TECHNOLOGIES

Vol. 12 No. 5 5/2010

WiMAX Development and 4G Evolution

Opportunities, Challenges and Practices of
the Internet of Things

ZTE中兴

ZTE Base Station Market Shares Climb to World's Top 4 Position

Company achieves a global market share of 12.6% in 2009

15 April 2010, Shenzhen, China — ZTE revealed that Infonetics, a leading market research firm, has recently released a 2G/3G Mobile Infrastructure and Subscribers Report on the global wireless communication equipment market in 2009. According to the report, major changes have occurred in the shares of the global wireless communication market. By carrier frequency, ZTE achieved a market share of 12.6%, overtaking Alcatel-Lucent to become the fourth largest firm in the industry. By sales revenues, ZTE saw its macro base stations claiming 9.1% of the global wireless market in 2009 Q4, also placing ZTE in fourth place.

Infonetics' report shows the effects from the financial crisis in the form of the global wireless equipment RAN market falling 9.2% in 2009, down to US$38.6 billion from US$42.5 billion in 2008. By system, WCDMA RAN market overtook GSM market for the first time, achieving a market share of 41%, GSM saw its share of the overall wireless market down to 36%, while CDMA at 16% and TD-CDMA 7%. Infonetics anticipates that by 2014, LTE will account for 22% of the global RAN market, while GSM and WCDMA will reach 30% and 42%, respectively.

In 2009, 325,000 Base Transceiver Station (BTS) units were deployed in China, accounting for some 1/3 of the total base stations deployed worldwide (not including Remote Radio Head). This is the largest 3G deployment in the world to date. Infonetics also forecasts that after 2010, Asia Pacific will maintain its global market share above 40%. Populous countries such as India, Indonesia and Vietnam will deploy wireless broadband base stations, and the global wireless market will achieve single-digit growth over 2009.

ZTE has been adopting green and cost-saving technology strategies to help protect the earth and the investments of operators. The company has collaborated with China Unicom to successfully deploy a green 3G network that utilizes environment-friendly, energy saving commercial base station equipment. ZTE's green 3G base station site relies on wind and solar energy for operation. Compared with similar base stations, this green solution reaches 100% energy-saving capabilities. Its remote control feature requires no on-site manpower support and, thus helps China Unicom save costs to further lower its TCO.

ZTE's global GSM sales continued to grow swiftly in 2009, with shipments of over 750,000 carrier frequencies in the past year. As its share in the global newly added market rose to almost 20%, ZTE is now one of the top 3 equipment vendors in the industry.

In 2009, ZTE successfully sold its GSM products to world-class multinational operators such as Telenor, Teliasonera and Cell C, making large-scale advancements in European and emerging markets.

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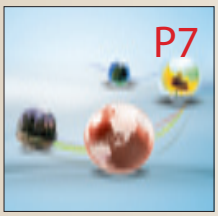
Leading Edge

Opportunities, Challenges and Practices of the Internet of Things

For the telecommunication industry, the Internet of Things is not only an opportunity to capitalize on existing success stories—such as mobile and wireless communications—but also to explore new frontiers

Focus



WiMAX Development and 4G Evolution

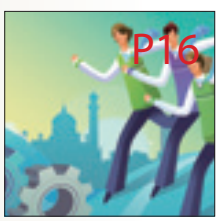
WiMAX and LTE, have both adopted OFDM and MIMO in their profiles, and are often branded “4G” technologies

Pole-Mounted Base Stations for WiMAX Networks

Solving the problem of insufficient sites while lowering engineering costs

Experiencing a Tour of Extreme-Speed Broadband in Malaysia

ZTE collaborates with P1 to build a No.1 commercial WiMAX network



WiMAX Cloud in the Indian Sky

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ZTE Profile

ZTE is a leading global provider of telecommunications equipment and network solutions. It has the widest and most complete product range in the world—covering virtually every sector of the wireline, wireless, service and terminals markets. The company delivers innovative, custom-made products and services to over 500 operators in more than 140 countries, helping them achieve continued revenue growth and shape the future of the world's communications.

ZTE中兴 ZTE CORPORATION

Opportunities, Challenges and Practices of the Internet of Things

By Fan Wanpeng and Li Yu

Fan Wanpeng, Vice Director of Service & Software Product Planning Department, ZTE Corporation

Li Yu, Chief Engineer of M2M Product, ZTE Corporation

Opportunities

In the future, the Internet of Things will undergo three stages of development: a typical application stage, growth in scale, and full-scale development.

- Typical applications: By integrating value chains, the Internet of Things service support platform, and existing Internet of Things applications will combine to provide end-to-end Internet of Things solutions. This will resolve some issues in social and economic life relating to environmental management, intelligent transportation, intelligent electric power, intelligent agriculture, public safety, and disaster prevention. Moreover, a cooperative model of value chains, and a development model of Internet of Things industrialization can also be created for large scale applications of Internet of Things.
- Growth in scale: The architecture and functionality of the Internet of Things service support platform will be continuously enhanced based on typical applications of the first stage. Through the cooperation of value chains, some new applications for the Internet of Things will be put into practice. And in the Internet of Things service support environment, universal applications oriented towards the public will be provided. Internet of Things technologies will drive efficient and rapid growth of the information economy.
- Full-scale development: Internet of Things technologies will penetrate into all areas and achieve full-scale development with a well-established industrial chain model. All objects will be connected through the Internet of Things, thereby achieving full connectivity and realizing the goal of an "anytime, anywhere, anyone, and anything" world.

The general form of the Internet of Things is M2M ("machine to machine," "machine to man" or "man to machine"). In its Internet Report of 2005, the ITU points out that "for the telecommunication industry, the Internet of Things is not only an opportunity to capitalize on existing success stories—such as mobile and wireless communications—but also to explore new frontiers. In a world increasingly mediated by technology, we must ensure that the human core to our activities remains untouched. On the road to the Internet of Things, this can only be achieved through people-oriented strategies." Therefore, along with machine-to-machine communication, focus should not be lost on machine-to-man and man-

to-machine communications. Drawing on the experience of individuals, the resource advantages of a large number of mobile phone users, and operator capabilities, full machine-to-machine and man-to-machine communications can be realized. This will bring Internet connectivity to all things and objects.

The Internet of Things industry has good prospects—the M2M market is expected to generate 60 billion U.S. dollars by 2012. Presented with such a large market opportunity, operators around the world have invested heavily in the research and development of M2M. Orange, for example, has developed more than 1 million SIM cards for M2M services in Europe; Vodafone began launching M2M services in 2002 (including vehicle management, automatic meter reading, and security monitoring); and Telenor began launching M2M services in 1997 (in areas such as logistics, security, and location positioning).

Problems and Challenges

In recent years, China's Internet of Things industry has developed rapidly, and has led the world in the development of the Internet of Things technology. However, due to the lack of unified standards, current applications of Internet of Things are independent. Without well-defined industry segmentation, numerous terminal vendors, application providers, and system integrators fail to cooperate with one another. This will impact large-scale development across the entire industry.

Furthermore, although the Internet of Things refers to the connection of physical objects, its core lies in information interconnection and convergence. Because of some existing industrial barriers, there are information islands in different fields. This has greatly hindered information interconnection and convergence, making it difficult to interconnect all things.

For the Internet of Things to be successful, a clear specification for the horizontal technical segmentation of the entire industrial chain is needed. In order to achieve large-scale development, it is necessary to specify its standards, openness, and interoperability. Currently, standardization organizations, research institutes, universities, telecom operators, equipment manufacturers, industry application providers, and terminal vendors in China are jointly working on the standardization of the

Internet of Things. This will cover information sensing, data transfer, applications, and the service platform.

The industrial structure of the Internet of Things is quite complex, involving many sectors (e.g. terminal vendors, system integrators, and network operators). With production value as high as one trillion yuan, each sector (vendor or operator) within the Internet of Things industrial chain has its own strengths. Yet only through the alliance of strong sectors can the Internet of Things provide customers with complete product solutions. Standardization is important for industrial alliance, and is also the basis of system integration. Without standardization, it is impossible to achieve industrial alliance.

The Service Support Platform

A glance at M2M applications around the world shows that M2M is not widespread, and there is still a long way to go before large-scale applications become commonplace. To achieve widespread application, and to allow for information interconnection and sharing between different systems, it is necessary to build a new platform—the service support platform for the Internet of Things.

The Internet of Things service support system consists of four layers: the sensing layer, network transport layer, operation and management layer, and application layer (as shown in Figure 1). The sensing layer consists of a Wireless Sensor Network (WSN), RFID reader, and M2M terminals. The network transport layer contains various networks (GSM, CDMA, 3G networks, and fixed-line) offered by operators for the transfer of information between the sensing layer and application layer. The operation and management layer includes the operation support platform, and the operators' Business Operation Support System (BOSS) environment. Using standard protocols, the operation support platform can access terminals and applications, providing functionality such as authentication, billing, service management, and service acceptance, so that operators can manage Internet of Things applications in a unified manner. The application layer contains a number of industrial applications that call in various service capabilities through the operation support platform in order to meet service needs.

Internet of Things applications may possess a large number of telecom capabilities (such as SMS, MMS, Location-Based Service (LBS), and call center services), or third party services and resources. Figure 2 shows the M2M architecture of ETSI TISPAN. Open and converged service capabilities greatly reduce development barriers, laying a foundation for rapid growth of the Internet of Things. This is also the generic architecture for intelligent information processing in the future.

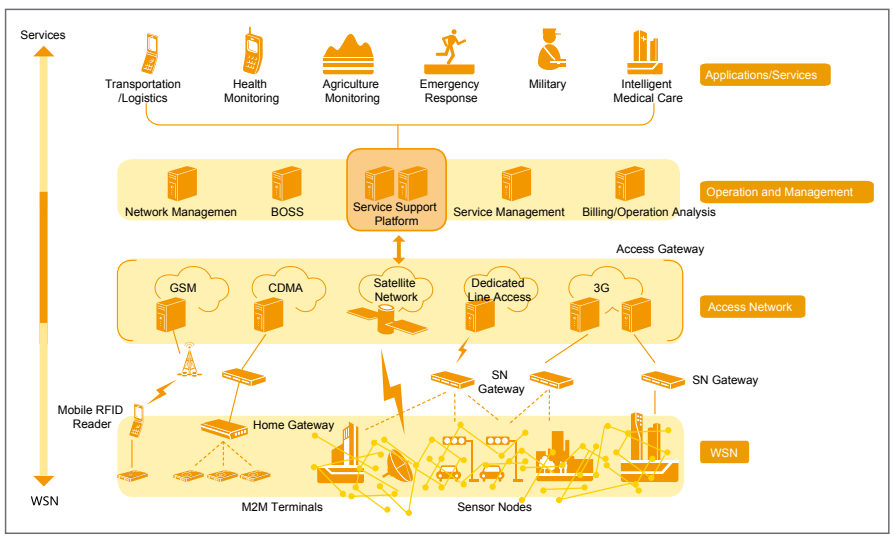


Figure 1. Framework of the Internet of Things service support system.

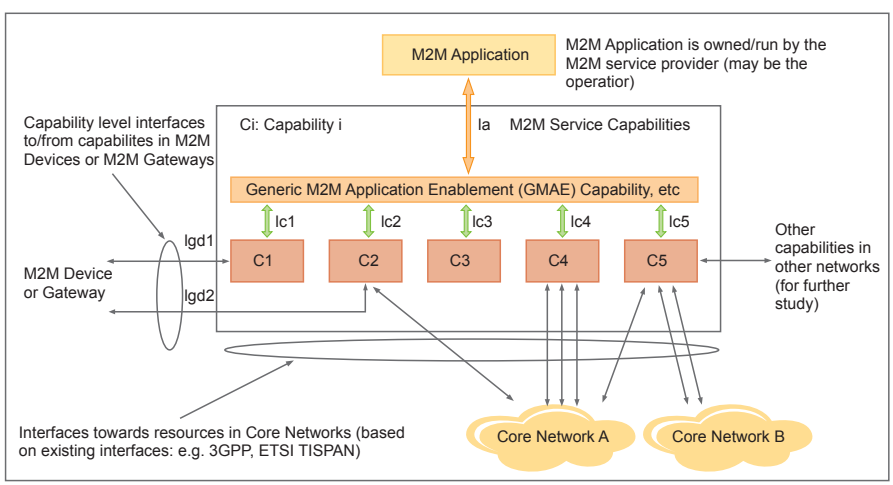


Figure 2. M2M architecture of ETSI TISPAN.

Based on such architecture, machine-to-machine, machine-to-man, and man-to-machine interaction and collaboration will be achieved, and convergence of Internet of Things applications fulfilled.

In addition, cloud computing also provides an important means of supporting flexible traffic growth and reducing application deployment costs. It addresses the issue of idle storage and computing capabilities of operators.

Network Optimization

With the expansion of Internet of Things applications, and the consequential opening up and convergence of information among different industries, existing communication systems will need to optimize their Internet of Things service models in the following ways:

- The phone number system will need to be optimized to accommodate an expansive number of "objects";
- Wireless resource management will need to be optimized to reduce power consumption and to meet the mobility requirements of "objects". For example, the uplink/downlink bandwidth required for machine-to-machine communication is quite different to that of man-to-man communication;
- Communication security systems will need to be optimized to meet the security needs of "objects".

Of course, the optimizations mentioned above will be implemented in line with network evolution. At present, the Internet of Things in China is in a typical application stage and has not yet found large-scale applications. In China's telecom networks, relatively small information flow is generated by the Internet of Things, and most of it is applied in the telecom industry. Therefore, the existing communication networks in China require no great changes except the introduction of an Internet of Things service support platform.

Applications and Practices

ZTE has developed applications for the Internet of Things. It has established a department based in Tianjin which specializes in the research and development of RFID products. Its RFID solutions include a portfolio of products used for all-in-one-card systems, an information-based campus, path identification, and logistics & warehousing. ZTE also offers a variety of M2M modules that can be widely applied in the fields of vehicle-mounted terminals, wireless meter reading, transportation, household appliances, and industrial cameras.

Below are some end-to-end applications of the Internet of Things provided by ZTE and its partners:

- Transportation: the radar-based traffic counter is used to detect traffic conditions on frequently-congested roads. It sends information about traffic congestion to the driver from a distance of 3km to 5km away by SMS or MMS, prompting them to choose another route. This alleviates traffic congestion.
- Intelligent car parking: wireless sensors are deployed in a carpark. Each parking space is equipped with one sensor node, which detects and monitors the occupation of the space. Information about the carpark is reported periodically to a database via a wireless sensor network and then sent to vehicles. At the entrance of the parking lot, the vehicles can obtain an overall picture of vacant parking spaces and quickly find the spaces.
- Telemedicine monitoring: in China, there are about 80 million people with heart disease. Due to limited medical facilities and staff shortages, monitoring these patients can be a challenge in many hospitals. With the Internet of Things applied in telemedicine, patients can use instruments to measure and record physiological indices such as heart beat, blood pressure, and pulse rate. This can be done at any time and sent to the expert system through the M2M platform.
- Smart electric meter reading: a smart electric meter reading system improves the automated processes of electricity providers. With the smart electric meter, users with long-term arrears will have their electricity automatically cut off. It also records power consumption at a time specified by users to help them save electricity.
- Greenhouse monitoring: this monitoring system collects environmental information from within a greenhouse and controls factors such as temperature and soil moisture. With this system, farmers need not stay in the greenhouse, but can determine the state of their plants at home on TV or mobile phone. In this way, they can plant cantaloupe in Wuxi City, southern Jiangsu, and mangos in China's Northwest Xinjiang Region.

The value chain of the Internet of Things is very long. ZTE will strive to construct a standardized, open and smart Internet of Things platform that allows application developers to expand industrial service capabilities in a fast and easy manner. Ultimately, Internet of Things applications could be deployed to satisfy customers' various personalized requirements.

WiMAX Development and 4G Evolution

By Sean Cai

Sean Cai, Deputy General Manager of ZTE WiMAX Product Line and WiMAX Forum Board Member

The Important Role of the WiMAX Forum

What is WiMAX? It is an acronym for Worldwide Interoperability for Microwave Access, and is based on the IEEE 802.16-2005 standard. The latest version of this standard is IEEE 802.16-2009, which includes amendments on the previous IEEE 802.16-2005. IEEE standards only specify the Physical (PHY) and Media Access Control (MAC) layers. The WiMAX Forum has played an important role in ensuring all equipment and devices manufactured according to the standard are interoperable and can be deployed worldwide. It has also defined specifications for upper layers and network components for commercial deployment. The relationship between IEEE 802.16 and the WiMAX Forum Technical Working Group/Network Working Group (TWG/NWG) is shown in Figure 1.

WiMAX NWG has defined the WiMAX network reference model—which standardizes all interfaces to simplify Network Inter-Operability Test (IOT) (see Figure 2.)

The WiMAX Forum consists of multiple working groups. How the WiMAX Forum functions with various working groups is illustrated in Figure 3.

Equipment with the current version of WiMAX 1.0 is also sometimes referred to as "802.16e" equipment by people familiar with the WiMAX legacy. WiMAX has adopted scalable Orthogonal Frequency-Division Multiple Access (OFDMA) technology. In order to increase frequency efficiency and maximize network throughputs, OFDMA—along with Multiple-In Multiple-Out (MIMO) antenna technology, and Hybrid Automatic Repeat Request (HARQ) error correction scheme—has been part of a mandatory profile. Enhanced versions of OFDM and

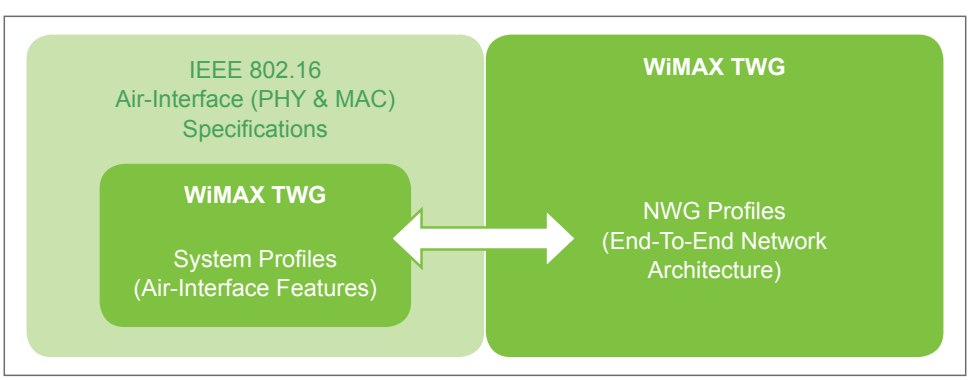


Figure 1. Collaboration of IEEE 802.16 and WiMAX Forum.

MIMO will also be adopted by ITU as an IMT-Advanced standard (also referred to the fourth generation (4G)). Therefore WiMAX and LTE, have both adopted OFDM and MIMO in their profiles, and are often branded "4G" technologies.

ZTE joined the WiMAX Forum in 2004, and has been a WiMAX Forum Board Member for over five years. As a leading global provider of end-to-end WiMAX solutions, ZTE has been playing a very active role in promoting WiMAX technology worldwide. It is also one of the most important contributors to the WiMAX ecosystem. The past five years have seen the rapid growth of WiMAX membership, from fewer than 50 members to more than 500, and the ecosystem has been shaped by silicon providers, system equipment vendors, and operators alike. The size of the WiMAX Forum Board of Directors has increased from fewer than 10 board members to more than 20, and this has steered the ecosystem in a healthy direction. More importantly, a number of stories have emerged about successful WiMAX deployments worldwide. ZTE is very fortunate to have been part of these showcases. Since the second half of 2009, ZTE's leadership in this new market segment has been evident.

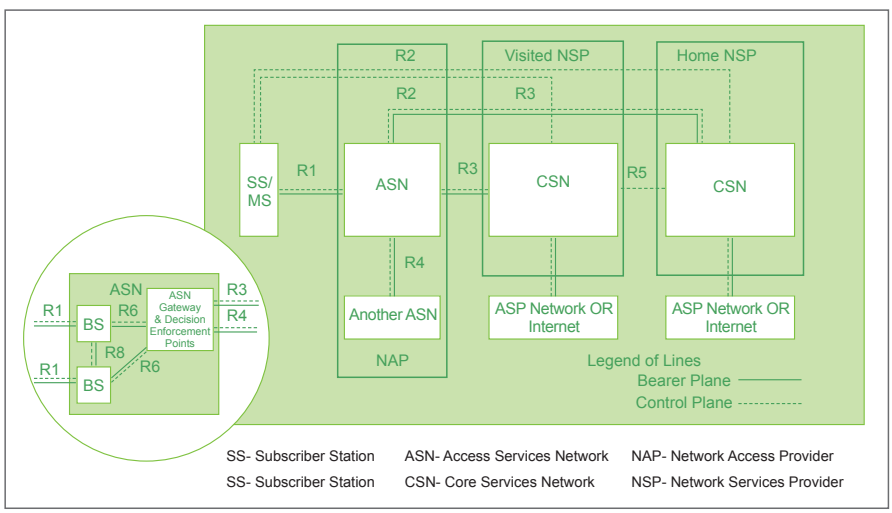


Figure 2. WiMAX network reference model.

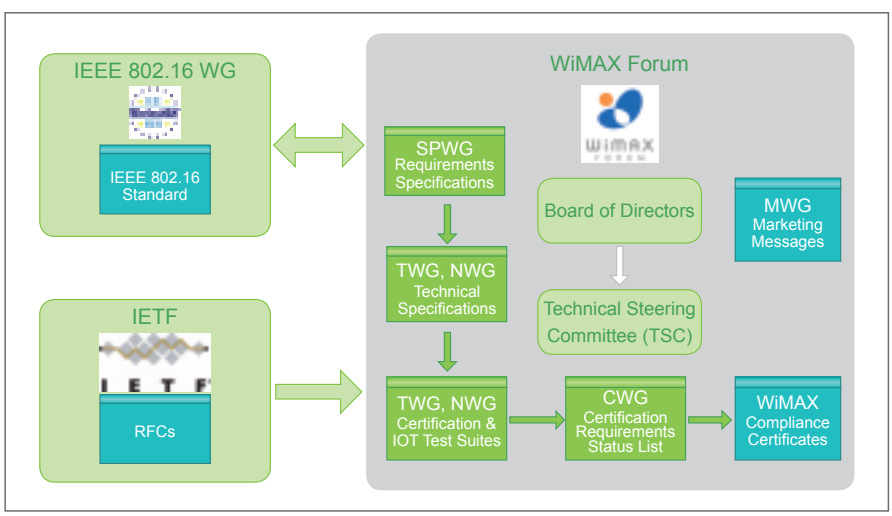


Figure 3. WiMAX standardization process.

Shifting IEEE 802.16m Development into High Gear

After the IEEE 802.16-2005 standard was released, the 802.16 Working Group continued to make various amendments to it. In September 2006, members from eight companies proposed a new 802.16m Project Authorization Request (PAR), and ZTE was one of them. The development of 802.16m enables greater speed and efficiency, more advanced features, and more converged data communications while, at the same time, maintaining backward compatibility support of legacy Mobile WiMAX networks and terminals (which have been deployed all over the world). The main purpose of 802.16m is to comply with IMT-Advanced requirements and timelines, so that 802.16m—as a candidate to become a 4G standard—can be adopted by ITU in IMT-Advanced.

Since the 802.16m project began, the

802.16m Working Group has attracted more than 1200 professionals from 240 organizations in over 23 countries. The number of contributions has increased rapidly over the past three years: over 300 contributions in 2007, over 1500 in 2008, and over 2200 in 2009. The first standard of 514 pages was drafted in July 2009, and has successfully entered the Letter Ballot stage.

There are many enhancements earmarked for inclusion in 802.16m. The key areas are protocol structure, frame structure, PHY and MAC layers, Convergence Sub-layer (CS), Multi-hop Relay, multi-carrier support, Location Based Services (LBS), Enhanced Multicast Broadcast Service (EMBS), interference mitigation, and support of Femtocell and Self-Organization Network (SON) deployment.

The WiMAX Forum has endorsed IEEE's submission to ITU-R of an IEEE 802.16m-based candidate for IMT-Advanced. The WiMAX Forum has also announced that it will finalize its WiMAX Release 2 system profile based on IEEE 802.16m, and it will do this in parallel with IMT-Advanced, ensuring that WiMAX Release 2 networks and devices remain backwardly compatible with legacy WiMAX deployments. IEEE 802.16m will feature major enhancements in 4×4 MIMO design, VoIP capacity, spectral efficiency, latency, handover speed, cell range, and coverage, and it will support wider operating bandwidth in both TDD and FDD duplexing. IEEE 802.16m systems will provide a much faster data speed than the current Mobile WiMAX Release 1. WiMAX Release 2 equipment could be available for commercial deployment as early as 2012.

ZTE has been one of the most active and committed companies in 802.16 standard development, and has long history of contribution to various Working Groups (starting with the 802.16e project). ZTE continues to demonstrate its strong commitment, playing an important role in ongoing 802.16m standard development. As part of ZTE's overall 4G strategies, both ZTE's WiMAX CSN and ASN equipment should be software upgradable to comply with WiMAX Release 2 (based on 802.16m) and future IMT-Advanced specifications.

WiMAX Networks Paving the Way Towards 4G (IMT-Advanced)

The 802.16m standard will offer new capabilities and efficiencies to meet the challenges of IMT-Advanced. In the same way current 3G systems were established through ITU's IMT-2000 project, the ITU Radio Communication Sector (ITU-R) is in the process of establishing an agreed and globally accepted definition of 4G wireless systems using the name "IMT-Advanced."

The IMT-Advanced project schedule shows that Radio Interface Technology (RIT) or Set of RITs (SRIT) candidate proposals were submitted and received in 2009. The technology evaluation process has begun, and is expected to be finalized by July 2010. In Release 10, 3GPP will address IMT-Advanced requirements in a version of LTE called LTE-Advanced. The LTE-Advanced specifications could become available by 2011. WiMAX will address IMT-

Figure 4. Is your network fast enough?

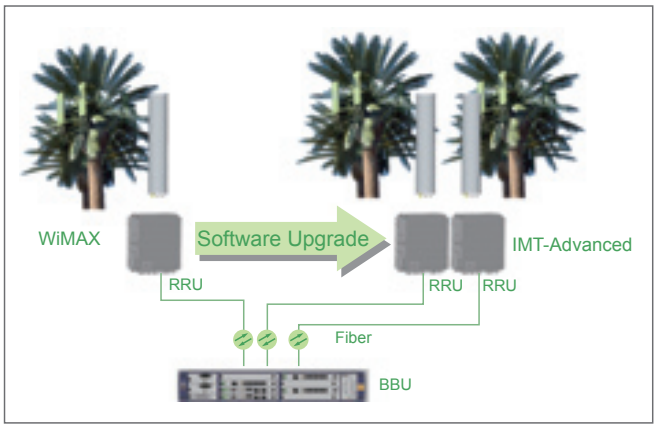


Figure 5. ZTE's software upgradable base stations.

Advanced requirements in a version called Mobile WiMAX Release 2, and its RIT system profile will be based on the IEEE 802.16m specification. The IMT-Advanced radio interface specification is scheduled to be completed in February 2011. From past experience, it can be reasonably expected that IMT-Advanced equipment will be commercially available by 2012-2014.

This timeframe, however, seems insufficient when considering the strong and ever increasing demand for data today. According to Moore's Law, silicon halves in size and doubles in speed every 18 months. That translates into faster and cheaper silicon. The rapid growth of data consumption, observed by many operators and forecasted by analysts, has caused traffic congestion in some networks today.

Despite the recession, the good news is that broadband markets are still growing. In fact mobile Internet has been experiencing explosive growth. During downturns, people tend to spend less on their shopping and cut down on other expenses rather than give up their mobile phones or broadband Internet access. However, the amount of network traffic has been increasing much faster than revenues can be generated. Various forms of mobile Internet access have doubled from last year, and this trend shows no sign of slowing. Social networking traffic tops the list with an annual increase of over 400%.

Smartphones, netbooks, and USB dongles are commonly used today for mobile Internet access. People read emails, access news, book airline tickets, watch video clips, and do their shopping online. Behaviors and lifestyle are changing, and instead of doing at home, we now go online with handheld devices. How to handle the explosion of data traffic is fast becoming the biggest problem facing operators. Indeed, like Pamplona crowds awaiting the bulls (see Figure 4), most gear in today's networks is not ready for the potential growth in data traffic over the next 2-3 years.

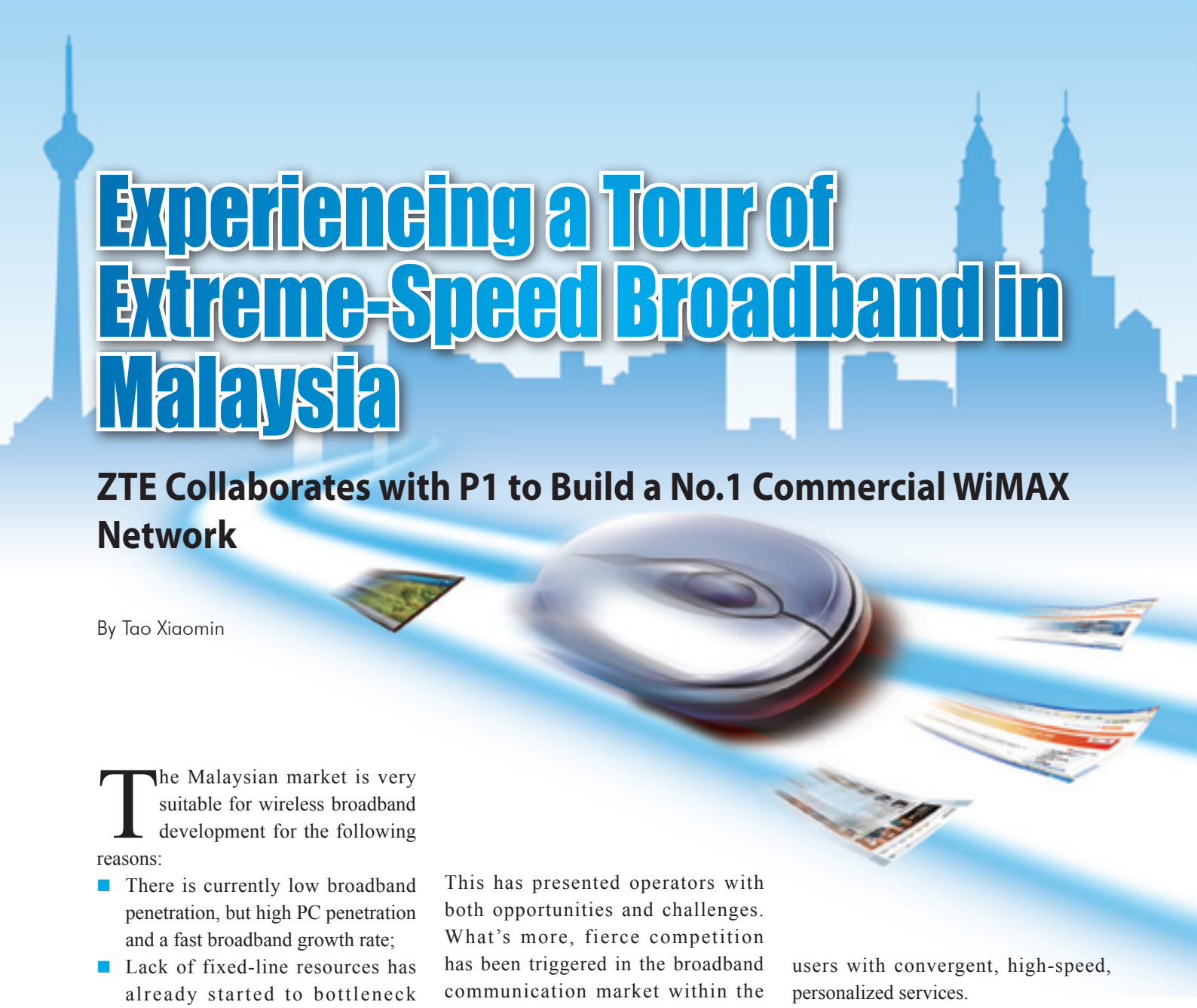
WiMAX is a proven technology, and an early taste of 4G technology. Stories of successful WiMAX deployment come from all parts of the world. The Total Costs of Ownership (TCO) have proven much lower compared with other technologies, and WiMAX reduces the wait time for Return On Investment (ROI). The industry has observed that the time delay for ROI is reducing.

ZTE has maintained rapid growth and continued to innovate despite the global economic recession. It has been positioning for the next wave of explosive broadband growth. With ZTE's WiMAX product portfolio, an operator can start rapid deployment of WiMAX to meet both fixed and mobile broadband demands, reliably and at very competitive cost. The TCO of the network can be greatly reduced. In the closely run race towards 4G, whichever operator can build their networks fast enough will likely win the mobile broadband markets. Like buying insurance for an uncertain future, ZTE's CSN and ASN (including base stations) are made up of common DSP platforms that can be software upgraded to comply with WiMAX Release 2 and future IMT-Advanced specifications. Figure 5 shows ZTE's software upgradable base stations. Each year, ZTE ships tens of thousands of base stations with the same platform for the deployment of different technologies. It doesn't make sense to wait for IMT-Advanced—to be the market forerunner; operators can start with WiMAX now and leave decisions about technology evolution for the future.

Experiencing a Tour of Extreme-Speed Broadband in Malaysia

ZTE Collaborates with P1 to Build a No.1 Commercial WiMAX Network

By Tao Xiaomin



The Malaysian market is very suitable for wireless broadband development for the following reasons:

- There is currently low broadband penetration, but high PC penetration and a fast broadband growth rate;
- Lack of fixed-line resources has already started to bottleneck broadband growth;
- Much of the population can afford broadband service due to a comparatively high GDP per capita;
- Wireless broadband requirements of the population are already at a mature stage.

The past five years have seen rapid growth of broadband in Malaysia. In order to promote the development of broadband communication, the Malaysian government and the Malaysian Communications and Multimedia Commission (MCMC) issued four 2.3GHz WiMAX licenses simultaneously in 2007. This has presented operators with both opportunities and challenges. What's more, fierce competition has been triggered in the broadband communication market within the country.

Packet One Networks (Malaysia) Sdn. Bhd. (P1), a subsidiary of the Malaysian Greenpacket Group, specializes in the WiMAX/WiFi business. In 2008, P1 was the first operator in Malaysia to offer WiMAX services and also the first operator in South Asia to commercially implement WiMAX 802.16e. Faced with fierce market competition in the broadband industry, and the threat from traditional 3G operators, it was urgent for P1 to optimize its network structure, reduce its operational costs, expand its network coverage, and provide users with convergent, high-speed, personalized services.

Facing Three Challenges

After many technical discussions and much field research into the comprehensive solutions of different telecom vendors, in March 2009, P1 selected ZTE to deploy the second phase of its WiMAX network.

Prior to network construction, P1 and ZTE faced three challenges:

- Environmental constraints: Malaysia is a famous tourist destination in Southeast Asia. The country has a complicated geographic environment featuring mountains, lakes, and a long

coastline. With a population of 28.31 million and an area of approximately 330,000 square kilometers, the country also has a relatively high population density (85.81/km2).

- Various types of sites and complicated networking: This was a new project with no existing network infrastructure. Therefore, it was necessary for P1 to build new sites, which required plenty of land. In addition, this project also required the swapping out of Alcatel-Lucent equipment.
- Significant time constraints: P1 required 459 sites to be completed within three months. The standing record in the network construction industry, however, had been nearly 500 sites built over a six-month period.

Delivering a Quality WiMAX Network as Required

Confronted with such a challenging task, ZTE collaborated with P1 to establish a three-step project plan that would guarantee the network's progress, from site construction to base station replacement and overall upgrade.

With rapid, high-quality, end-to-end delivery capabilities, ZTE achieved remarkable results on the P1 project in 2009. On March 21, ZTE signed the contract; on March 23, ZTE delivered the first batch of equipment; on April 25, ZTE finished commissioning the first site; and on April 29, ZTE put the first site into commercial use. After P1 prepared the sites, ZTE finished site delivery and passed the final acceptance testing in two weeks as planned.

As the project moved ahead, P1 gained confidence in ZTE's problem solving and delivery capabilities. After witnessing the outstanding performance and high reliability of ZTE's WiMAX system, P1 selected ZTE to replace Alcatel-Lucent. As a result, ZTE increased its number of sites from nearly 500 (planned in early 2009) to more than 1000.

To migrate users to the new network, P1 adopted ZTE's network cutover and user swap scheme for smooth network implementation, uninterrupted service provision, and quality service experience. To these ends, P1 and ZTE spent three months experimenting with and testing solutions; these tests involved hundreds of items.

After careful and comprehensive preparations, P1 successfully migrated its users to the new network and achieved the expected results. P1's CTO H.S.Lim praised ZTE highly for its accomplishments: "ZTE's cutover scheme was very suitable for P1 because it allowed every P1 user to be migrated to the new network without their knowledge."

Breaking Records with Various Innovations

ZTE successfully overcame the

"Our goal is simple—to make broadband a right for all Malaysians. To deliver this commitment, the rapid and quality deployment of the P1 W1MAX network is crucial. P1's appointment of ZTE is another step in crystallising our commitment by accelerating the deployment of P1 W1MAX networks in more areas to meet the overwhelming consumer demand for high-quality, high-performance wireless broadband."

—Michael Lai, CEO of P1

difficulties of a complicated wireless environment, difficult site acquisition, and long construction approval process. After three months, ZTE had finished swapping, constructing, commissioning, and optimizing all base stations, and had set a new record for the fastest construction of a wireless broadband network in the Asia-Pacific region.

ZTE's distributed base station architecture makes networking flexible and efficient. It can be flexibly deployed, adheres to green principles, and is easy to install and use. Moreover, it is fully compatible with the advanced functions of Wave 2: 2×4 MIMO and HARQ. This has helped P1 reduce its total network costs, accelerate its network deployment, and maximize its investment.

High-performance products guarantee an excellent user experience. In order to provide users in the commercial network with high-bandwidth data services, P1 required a service test in a trial network of 254 users per sector. Among three participating vendors, the test results showed that ZTE performed the best in terms of system performance, total sector traffic, single user download traffic, and download stability.

ZTE's three-dimensional coverage solution makes for an exceptional network. Besides its large-scale macro base station coverage solution, ZTE's mature indoor coverage solutions provide even more convenient and efficient WiMAX broadband access in many different scenarios. These solutions help realize fast and cost-effective network deployment in densely populated key areas.

Professional network planning and optimization guarantees a high-quality network. Networking with 3 ×10M makes full use of bandwidth, but it easily causes inter-sector interference. A reasonable solution involves using professional network planning and optimization to minimize the interference while guaranteeing high-speed broadband. ZTE performed well in the KPI tests and its network planning and optimization capabilities were highly praised by P1.

Creating a Better Future Together

P1 has always adhered to the principle of "Customer First", providing premium quality broadband services, and establishing their brand image as the future industry leader. They attach great importance to high-quality network construction, insist on early market penetration, and choose mature products, solutions, and first-class engineering to give their users an enhanced experience.

Inheriting P1's principles of "Simplicity, Premium-Quality, and Efficiency," ZTE was the sole builder of P1's Phase II network. The IOT test center in Malaysia—constructed by P1, Intel, and ZTE—has also been completed, giving a new impetus for development to the WiMAX industry worldwide. Together with P1, ZTE will deploy networks in 31 Malaysian cities, constructing the largest, fastest, and best user-experience commercial mobile WiMAX network in Southeast Asia.

As an emerging operator with no network infrastructure, P1 required not only technologies and solutions, but also customized services and rapid response. To guarantee the project's successful delivery, ZTE set up a technical team by transferring experienced engineers from around the world. Two hundred experts from cooperating companies in 10 countries were gathered together, and dozens of senior project management experts were hired to help P1 build world's leading broadband mobile network. So far, P1 has seen a great improvement in its network performance and a rapid growth in its user base (now over 200,000).

Pole-Mounted Base Stations for WiMAX Networks

Solving the Problem of Insufficient Sites While Lowering Engineering Costs

By Zhang Jun

The acquisition of suitable sites for equipment installation plays an important role in speeding up network deployment and can save on investment. Traditionally, mobile operators have installed their macro Base Stations (BSs) in shelters or houses. When building a new network, they may consider using these existing sites. Most new operators, however, lack such sites and require simple installation solutions to reduce the number of shelters and equipment rooms. In this way, they can rapidly bring their network into operation while lowering investment costs.

Operators face the following problems when planning to build a new site:

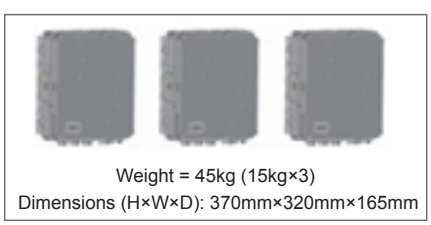
- For operators with existing sites: They have insufficient space on poles for more antennas, insufficient space in equipment rooms for more racks, or insufficient space in racks for more equipment. They aim to make the most of their existing sites.
- For operators that lack sufficient sites: They hope that radio equipment has a small footprint, is lightweight, and requires little of its installation environment. If so, they can install equipment in any site, thus reducing site rent and the amount of labor involved in installation.
- Installation difficulties have long been an issue for operators. Most 2G and 3G macro base stations have high requirements of their installation environments. Air conditioners, for example, are required in equipment rooms or shelters. Renting equipment rooms demands much coordination work and the rent is often very high. Shelters must also be transported by large cranes, which require significant amounts of money and manpower.

Tailored to operators' diverse needs, ZTE's pole-mounted base stations have effectively solved problems that plague operators during network construction. This solution is more than a product solution; it is a total solution covering product design, logistics, engineering, and installation. It can reduce installation time by more than 50%, reduce installation expense by more than 30%, and requires half the number of installation engineers by virtue of the features detailed below.

Division into installation packages

In ZTE's pole-mounted base station, all equipment (including cables) is divided into several installation packages. One installation engineer can carry each installation package without using any auxiliary tools. (According to international standards, the maximum weight-bearing capacity of one person is 40 kg. Auxiliary tools are required if one person is required to carry a load more than this).

- Base station package



Weight = 45kg (15kg×3)
Dimensions (H×W×D): 370mm×320mm×165mm

The base station installation package includes outdoor Remote Radio Units (RRUs) or integrated BSs. One site (containing three sectors) has three BSs, and each BS weighs less than

15kg. Therefore, the package can be installed in a location by a single person without the need for auxiliary tools.

- Antenna package

Weight < 15kg (5kg×3)
Dimensions (H×W×D): 860mm×180mm×90mm

Antennas for the three sectors are less than 30kg.

- Cable package

Weight < 10kg each
Volume < 0.5 cubic meter each

This package includes cables and installation materials. During equipment production and packaging, each sector is equipped with one cable package. The weight of each box is less than 10kg.

- Cabinet package

Weight < 15kg (in full configuration)
Dimensions (H×W×D): 210mm×480mm×600mm

Devices such as the Indoor Unit (IDU), Baseband Unit (BBU), and power supply can be installed in a small outdoor cabinet. ZTE's tailored small outdoor cabinet can be mounted on a pole. It weighs less than 15kg and has a height of 600mm.

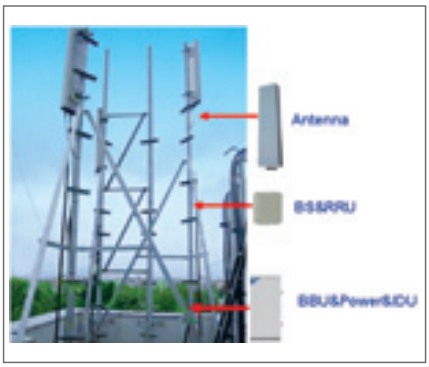


Figure 1. An installation where there is enough space on the existing poles.

Figure 2. Installations where there is insufficient pole space.

Easy installation engineering

To speed up installation engineering, the base stations can be customized according to the size and weight of the installation packages. Installation engineering includes the following steps:

- Step 1: Transporting equipment to the site;
- Step 2: Carrying equipment to the place of installation;
- Step 3: Installing the equipment.

ZTE's pole-mounted base station significantly simplifies these steps. Due to the compactness of the equipment, Step 1 can be completed by a single worker in any vehicle. In Step 2, the worker can shift all equipment to the top of a building or tower by himself (unlike 2G or 3G macro BSs, which have to be carried by cranes or by multiple people). Similarly, in Step 3, only a single worker is needed to complete installation.

Flexible installation modes

Where new poles are built or there is enough space on existing 2G/3G poles (see Figure 1), the base stations and microwave transmission devices can be mounted on these poles.

Where there is no space on the poles, base stations can be mounted on a wall, pillar, or other surface (see Figure 2). This enhances installation flexibility and eliminates the need for new poles.

Power supplies and batteries are required at new sites. Power supplies can be installed in a small outdoor cabinet, and mounted on a pole. Due to their size and weight, batteries can be placed near the sites.

ZTE's pole-mounted base stations allow for flexible installation as they reduce dependence on specialized equipment rooms. They also allow operators to more than halve their transportation expenses. Because the need for purchasing shelters and air conditioners is eliminated, the site cost is reduced by more than 60%. With its customized, easy-to-follow installation packages, only one or two workers are needed to finish the installation of a site, thus reducing labor expenses by at least 30% and doubling the speed of the installation process.

WiMAX Cloud in the Indian Sky

Analysis of Indian WiMAX Market Opportunities and Operation Models

By Wu Jie

Market Opportunities

According to Internet World Stats (IWS), India had a population of 1.16 billion as of July 2009, and its GDP increased by 7.3% in 2008. India's population is not only huge, but its telecom market is the fastest growing worldwide.

The Indian telecom market is attractive because of its high growth rate and the prospective issuance of 3G and WiMAX licenses. Although the auctioning of these licences has been delayed many times, operators are still showing great interest. The Indian government even doubled the auction price of the 3G and WiMAX licenses despite many industries having been adversely affected by the global economic recession. Is there any chance then for 3G and WiMAX in the Indian telecom market?

It is significant that the Indian mobile voice market grew at a rate of 15 million new subscribers per month in 2009, and by the end of 2009, the total number of mobile subscribers had exceeded 500 million (see Figure 1). In India, there are more than 10 GSM operators and 6 CDMA operators. The wireless voice market is predominately shared by major operators Airtel, Reliance, BSNL, Vodafone, TATA, and Idea. Due to the large number of operators, intense competition in recent times has given rise to a price war that has seen call costs hit rock bottom. Some operators have even reduced call tariffs to 0.01 rupees per second, equivalent to a little more than USD0.01 cent per minute.

Compared with the fiercely competitive mobile voice market, the Indian broadband market is in its infancy. By the end of September 2009, the number of Indian broadband subscribers had reached 7.22 million with a penetration of only 0.6%. These figures are relatively low when compared with other developed or developing countries. The main reasons for low broadband penetration are lack of access to resources (such as copper or fiber cables), immature backbone networks, high taxes for Internet Service Providers, and high prices for Internet broadband.

But as PCs increase in popularity, and online games and videos are developed, the high-speed development of fixed-line broadband is inevitable.

If the Average Revenue Per User (ARPU) for dial-up Internet in India (see Figure 2) is taken as an example, we may infer that broadband tariffs would not decrease like voice call tariffs, but maintain a certain high price. This indicates the potential of the broadband market in India; how to seize upon such an opportunity has become a major concern of local operators.

WiMAX is a wireless broadband technology that has advantages over fixed-line broadband technologies like ADSL. Because it supports fixed, nomadic, portable and mobile access, and can be deployed quickly, WiMAX is well-suited for India—where there is a shortage of copper cable resources. In addition, some operators in India fail in their bid for a 3G license, while others—even with 3G licenses—cannot adequately develop wireless broadband services due to the limited 2×5MHz spectrum of their licenses. Therefore, utilizing the 20MHz spectrum in the 2.3GHz band for the operation of a WiMAX network is a desirable choice for Indian operators.

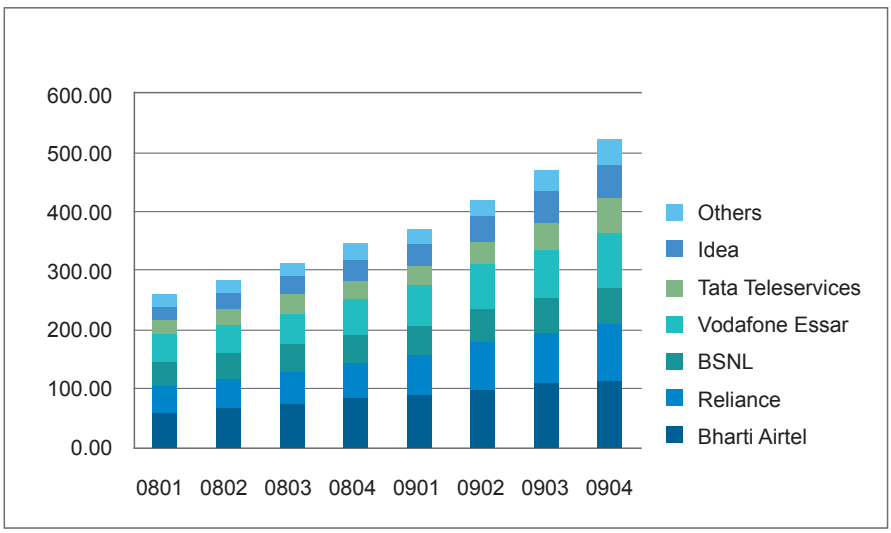


Figure 1. Wireless subscribers development in India (mil).

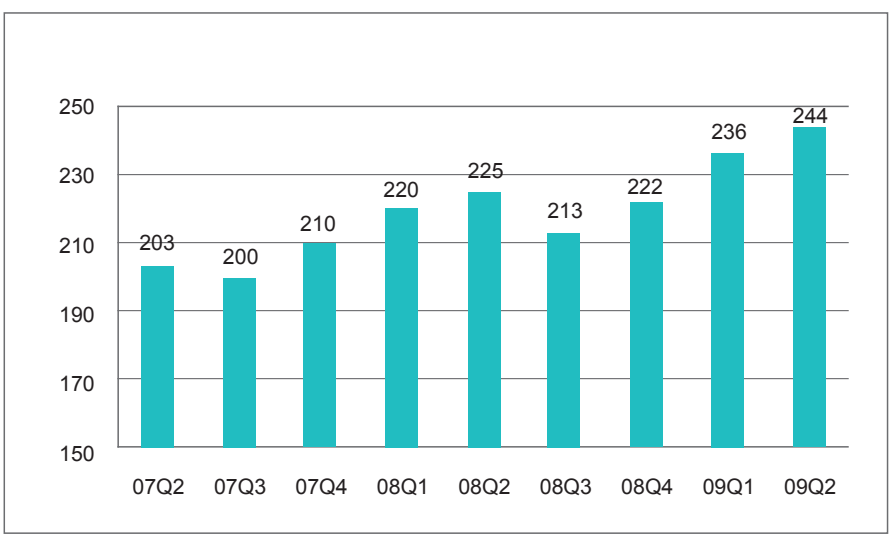


Figure 2. Dial-up Internet ARPU in India (rs/subs/months).

Operation Model

The operation model is concerned with a number of key issues, including revenue model, target customers, coverage strategy, service model, and terminal and pricing policies. For emerging WiMAX technology, a coverage strategy is devised according to target customers (determined by market supply and demand), and the operator's own strengths. Its service model is similar to that of 3G data services (except that it has higher data throughput and multi-service bearer capacity), and its terminal and pricing policies are based on the operator's development goal and target customers. As the revenue model of WiMAX is closely related to its service model, operators often deliver a package of several services according to their revenue models in order to generate more profit.

India is a country where mobile voice is growing rapidly but broadband supply is insufficient. Its low level of consumption is that of a developing country. The development of WiMAX in India can be divided into two phases:

Phase I: Rapid deployment of WiMAX networks in hotspots to deliver wireless broadband access services and to gain a greater market share

- Revenue model: the main source of revenue comes from monthly flat-rate broadband access services

- Target customers: small to medium sized enterprise users, and home users
- Coverage strategy: to first cover hotspot areas of A-class cities (such as CBD and high-end residential districts), and then to extend into other areas using outdoor coverage solutions
- Service model: to offer simple broadband access services
- Terminal policy: to support WiMAX-enabled netbooks, WiMAX outdoor modems, data cards, and USB
- Pricing policy: wireless broadband access services must have a distinct price advantage over other access services

Phase II: Developing VoIP, mobile broadband multimedia, and M2M services

- Revenue model: Additional sources of revenue will come from cooperation and revenue sharing with Content Providers or Service Providers (CPs/SPs); renting networks to Mobile Virtual Network Operators (MVNOs) as pipe providers; offering services to customers as service providers
- Target customers: small to medium sized enterprise users, home users, and high-end business users
- Coverage strategy: to cover both A-class and B-class cities, and to achieve seamless coverage using combined indoor and outdoor coverage solutions
- Service model: to offer additional VoIP, VPN, and M2M services to enterprise users; to offer VoIP, audio/video download, and mobile TV to home users; and to offer mobile/handheld services (such as mobile e-mail, mobile video phone, mobile office, and mobile online games) to high-end business users
- Terminal policy: to support WiMAX indoor modems, data cards, USB, WiMAX-enabled terminals, and handheld WiMAX terminals
- Pricing policy: wireless broadband access services to have a distinct price advantage over other access services; to set suitable and competitive prices for new service offerings based on evaluation of revenue models; and to offer a variety of price packages that bind subscribers

From the operator's perspective, the development of WiMAX operation mode in India can be divided into the following categories:

BSNL and MTNL

BSNL and MTNL are Indian state-owned operators given higher priority for spectrum acquisition. Upon invitation, they have started bidding for 3G networks. As the largest fixed-line operators in India, they possess copper cable resources and a base of enterprise users. In Phase I, they could make use of their good relationship with their enterprise clients and to offer fixed-line voice, fixed-line broadband, and wireless broadband services (thereby quickly seizing upon that market). In Phase II, they could provide a variety of value-added data service packages for high-end businesses while developing M2M enterprise services.

TCL, Airtel and Reliance

TCL, Airtel, and Reliance are relatively mature operators in India with a large number of voice subscribers. They have operational experience, are competitive in the market, and have clearly defined objectives for the development of WiMAX. In Phase I, they could deploy mobile voice and wireless broadband services to seize a greater market share. In Phase II, they could deliver a large number of mobile multimedia services to high-end customers by cooperating with SPs/CPs or by renting their networks to small and medium sized MVNOs.

Vodafone, IDEA, and Aircel

Vodafone, IDEA, and Aircel are Indian operators with an interest in the development of WiMAX, but have no plan to deploy WiMAX networks on a large scale. In Phase I, they could participate in the auction for WiMAX licenses in cities where they have a competitive advantage, and deploy WiMAX wireless broadband services in hotspot areas to seize upon the market. In Phase II, they could rent WiMAX networks from other operators to develop their broadband services, thus acquiring part of the broadband market share.

Broadband has been developing slowly in India, but with the industry now being actively supported by the Indian government, broadband services will become a new source of revenue growth in India's telecom industry. WiMAX licenses are soon to be issued for wireless broadband access, and this will quickly address the broadband access shortage, generating stable income for Indian WiMAX operators. Moreover, due to India's huge population and vast communication demands, the issuance of WiMAX licenses will drive rapid growth of the WiMAX industry (which includes services, terminals, and operation models), and help operators move from broadband pipe providers to broadband services providers.

FROST & SULLIVAN

Chinese Telecom Power Market

March 2010, selected from the global-growth consulting firm Frost & Sullivan

World Telecom Power Market Overview

Market capacity analysis

The world telecom power market generated revenues of $2.92 billion in 2009, which showed a negative growth rate of 12.3% over 2008 due to downturn in the world economy. Figure 1 shows the revenue for the world telecom power market in 2007, 2008, and 2009.

Market regional analysis

In 2009, the Asian and U.S. markets generated revenues of $1,456.2 million and $864.3 million respectively. Europe, the Middle East and Africa (EMEA) markets generated revenues of $599.2 million. EMEA is the only market, which experienced a growth compared to 2008.

In 2009, the Asian market had the largest revenue share in the world telecom power market, with 49.9%, followed by the American and EMEA markets with 29.6% and 20.5%, respectively.

Market competitive analysis

In 2009, Emerson, and Eltek Valere constituted the first tier of the world telecom power market, with a share of 24.9% and 22.3%, respectively, followed by Delta and ZTE with13.9% and 8.0% respectively. Others contributed about 30.9% of the total market share in 2009.

Chinese Telecom Power Market Overview

Market capacity analysis

The direct investment in 3G network scaled up to above RMB100 billion in 2009, which was the first year of 3G in China, resulting in strong demand for telecom power. The Chinese telecom power market generated revenues of RMB3.7 billion in 2009, which showed an increase in growth rate to 27.6% over 2008. The market shipment accounted for 357,000, with an increase in growth rate to 8.5% over 2008. Figure 2 shows the shipment for the Chinese telecom

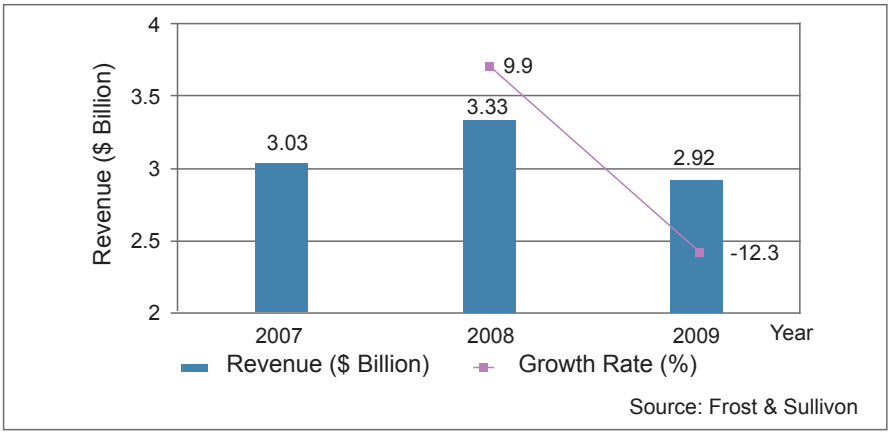


Figure 1. Revenue analysis: World telecom power market, 2007, 2008, and 2009.

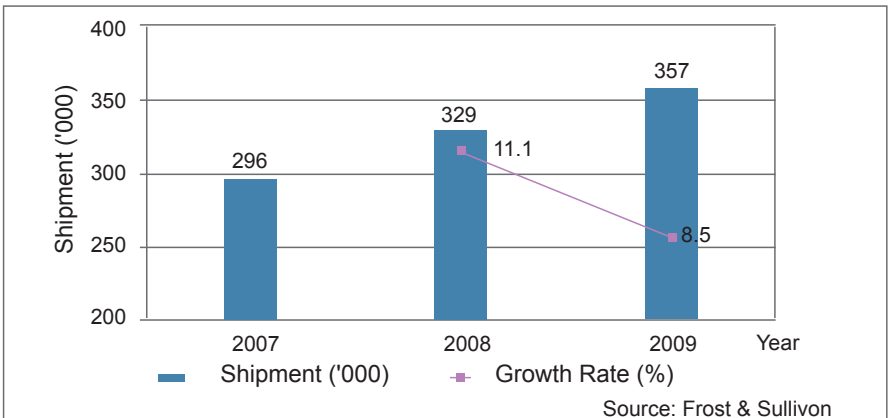


Figure 2. Shipment analysis: Chinese telecom power market, 2007, 2008, and 2009.

power market in 2007, 2008, and 2009.

Market competitive analysis

In 2009, China Mobile and China Telecom purchased telecom power products through public bidding. Emerson was ranked the first in the share of China Mobile with 28.0%, while ZTE had the largest share in China Telecom with 31.0%. China Unicom did not open bid last year. Its share of centralized purchasing was similar to that of 2008. ZTE was also ranked the first in the share of China Unicom with 40.0%.

In the telecom power the top three vendors held centralized purchasing by carriers in 2009, about 80.0% of the total telecom power market shipment share. ZTE had 30.5% of the shipment, and was ranked the first in Chinese telecom power market. Emerson was ranked the second in the market with a share of 27.4%, followed by Delta with 23.2%. Figure 3 shows the company market share by shipment for Chinese telecom power market in 2009.

Competitive Analysis of Major Telecom Power Vendors

ZTE

- Market position: ZTE provides stable, reliable, customized, and green telecom power products and solutions for global communication carriers. It is the market leader for telecom power in China.
- Service development: ZTE power products have obtained the top three achievements in the top three carriers purchasing for many years. It accounted for the largest share of purchasing in 2009. There is a set of ZTE power in each three mobile base stations, which provides power protection. ZTE was ranked the second in the share of China Mobile, which is expanding to 27 provincial branches; ranked the first in China Unicom, accounting for over 40.0% of the share; also ranked the first in the new share of China Telecom. It accounted for over 30.0% of the market share in 2008 and 2009. ZTE has achieved full coverage of Greater China, including Hong Kong, Macao, and Taiwan.
- Product strategy: ZTE provides a full range of telecom power products and solutions for a variety of telecom power application scenarios, such as the core engine room, and power products and solutions for indoor and outdoor base stations. It continues to launch new products, which increase the promotion level. It also focuses on program integration, market planning, and band and services. It takes full advantage of products of international different regions in promoting and integrating based on existing products in other regions. Moreover, it makes the most effective use of product resources to enhance the effectiveness of product promotion.
- Service strategy: ZTE saves cost by fast responding and through flexible dealing of the demand from carriers.

Emerson

- Market position: Emerson held the largest share in the telecom power market in China.
- Service development: In 2009, after China Mobile telecom power tenders, Emerson was the leading participant with 28.0% of the market share. After China Telecom tenders, Emerson had 20.0% of the market share. After China Unicom tenders, Emerson was ranked the second with a 35.0% of the market share.
- Product strategy: Emerson's development of communication power module dormant energy-saving technology can effectively control the rectifier module's operating mode. This reduces the no-load loss and increases the rate of remaining modules of the load by redundancy of the rectifier module. This increases the efficiency of operation of switching power system, reducing energy consumption.
- Service strategy: Emerson regards service as company culture.

Frost & Sullivan's GEM research method evaluates telecom power vendors in China in terms of both Growth Strategy Excellence and

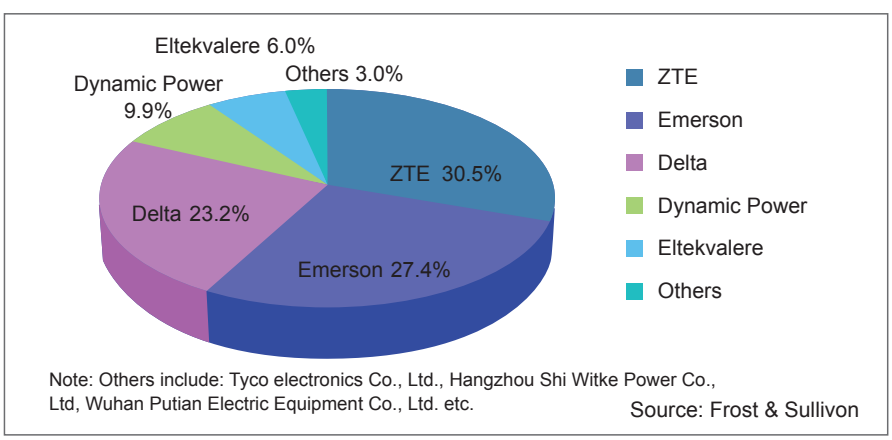


Figure 3. Market share: Chinese telecom power market (shipment), 2009.

Implementation Excellence. Paired comparison method is applied to grade them. The growth capacity of each provider will be shown in the GEM matrix. Figure 4 shows the comprehensive competitive evaluation of major participants for Chinese telecom power market in 2009.

Market Drivers and Restraints

Market drivers

- The all IP-based, broadband- and mobile-oriented direction of telecom network determines rapid development of telecom power

Due to changes in technology and customers' requirements of telecom network, the technology trend of telecom network will develop toward the all IP-based, broadband- and mobile-oriented direction. To satisfy customers that experience services/ enable customers to experience services anytime and anywhere, the mobile-oriented feature of network and the integration of mobile and fixed networks are necessary developments. Mobile devices, data communications equipment, and telecom power are expected to be the focal points of growth in communications equipment.

- Full service development by Chinese carriers is expected to result in rapid growth of the telecom power market

Full service operations receive high-level attention and systematic upgrading. Chinese carriers have taken measures to enhance full service development. Full service operations need full service network supporting. Therefore, telecom power and other equipment are expected to have great opportunities in the future.

- Network convergence is likely to further promote the development of telecom power

China's State Council held an executive meeting on January 13, 2010, and decided to accelerate the network convergence including telecom network, radio and television networks, and Internet. It also clearly stated the milestones and priorities with regard to telecom power. Network convergence is expected to result in new network deployment during the long term.

- 3G wave is expected to increase telecom power requirements

3G wave has created new opportunities for telecom power. In 2009, which was the first year of 3G in China, 3G licenses were issued. Telecom power is the key to the entire communications network infrastructure. After the boom and reform of 3G, carriers are enhancing base station coverage of communication, which is likely to increase telecom power requirements. It not only greatly promotes investment in communications industries in China, but also increases the domestic demand, which leads to the development of Chinese telecom power that will be beneficial for manufacturers.

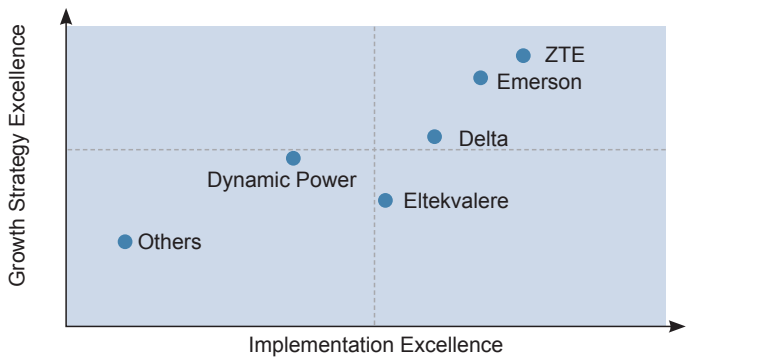
Market restraints

- Energy conservation and emission reduction have set higher requirements for vendors

With increasingly extensive range of network applications such as the Internet and mobile phones and upgrading of network speed and network bandwidth, the scale of the communications industry has become larger. Energy consumption and carbon dioxide emissions of the whole industry are much larger and increased more rapidly than that of the traditional aviation industry. The vendors of the communications industry must actively adopt green planning and introduce products with energy conservation and emission reduction technology. Therefore, high demand is expected for the technological innovation of telecom power products in future.

- Communications base stations, equipment, and the required power are getting smaller and smaller

3G construction has fast speed of building, small power and AC-DC power co-existed and so on. With 3G construction widely developing and the phenomenon of co-sited base stations increasing, carriers are focusing on miniaturization of the volume of power products. Power requirements are also decreasing, which is a restraint for the development of telecom power.



Note: Others include: Tyco electronics Co., Ltd., Hangzhou Shi Witke Power Co., Ltd, Wuhan Putian Electric Equipment Co., Ltd. etc. Source: Frost & Sullivon

Figure 4. Competitive evaluation of major participants: Chinese telecom power market, 2009.

MTN Cameroon Goes Green with Solar-Powered Base Stations

By Liu Xiaobing

The MTN Group is a leading South African-based mobile operator with operations in 21 countries throughout Africa and the Middle East. MTN has a presence in countries such as Nigeria, Cameroon, Cote d'Ivoire, and Iran. With a subscriber base of more than 4 million, MTN Cameroon—an important subsidiary of the African MTN Group—is the number one Multinational Telecom Operator (MTO) in the country.

However, as the company has expanded, the high costs of generating power with diesel generators have become a significant burden for MTN Cameroon. High-consumption diesel generators have also produced considerable amounts of pollutants that are harmful to the surrounding environment. MTN Cameroon has therefore long sought a renewable energy solution to this problem.

Challenges for MTN Cameroon

Slow business growth: In the urban and rural areas of Cameroon, the economy is unevenly developed—as is the telecom market. Some remote areas do not even have wireless signal coverage, which results in sluggish growth of mobile services in these areas.

Environmental pollution: Shortage of electricity is a serious problem affecting most African regions, and Cameroon is no exception. The majority of telecom operators in the country use diesel generators for power supply. In their daily consumption of fuel for power production, diesel generators emit a variety of pollutants—including particle matter, carbon monoxide, and hydrocarbons—all of which threaten human health and the environment. As a leading mobile operator in Cameroon, and with the largest market share, MTN Cameroon is committed to environmental protection. They hope to reduce carbon dioxide emissions and power consumption in order to improve the quality of life for local inhabitants.

High maintenance costs: Regular and frequent maintenance of diesel generators located in remote sites raises the costs (both in time and money) of sending personnel on business trips. Moreover, the price of oil continues to soar without any sign of letting up. This has contributed to the high operational and maintenance cost of diesel generators. The MTN Group has therefore required its Cameroon operations to greatly reduce the capacity of their diesel generators in order to cut down on network operating expenditure.

ZTE's Solar-Powered Solution

Green power is important in ensuring a clean living environment for people. After many technical discussions and field tests, MTN Cameroon chose ZTE's green solar-powered solution to address the issue of energizing mobile base stations while minimizing environmental pollution.

Green solar-powered site: ZTE has developed a customized solar-powered solution that consists of highly efficient solar panels, field-proven and reliable controllers, and a highly-protected outdoor cabinet. This not only reduces diesel consumption, but also limits air and noise pollution that arises from generators running 24 hours a day, 7 days a week. ZTE's solar energy

Backbone Solar-Powered Site for MTN Cameroon

solution takes into full account local climate, makes good use of abundant sunshine, and adopts a modular and reliable solar system design to significantly reduce site costs and realize truly green base station sites.

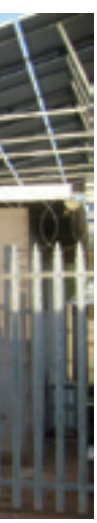
Space-saving outdoor cabinet: The solar-powered system including controllers and batteries cannot be placed in a shelter with limited space. ZTE has employed an outdoor cabinet with IP55 protection level, in which controllers and batteries can be installed. The outdoor cabinet is economical for MTN Cameroon, and saves on construction time.

Theft proof design and non-attended operation: The high risk of solar panel theft has long frustrated operators in Africa and stymied their attempts to turn to green power. To solve this problem, ZTE used theft-proof screws in its installation design and increased the height of stand bars to 3.5 meters. This guarantees security of solar panels and other components, which is necessary for non-attended operation.

Benefits for MTN Cameroon

All solar-powered sites have run smoothly on the network since they were completed and put into service. Operating expenditure has also been effectively reduced. For its expertise in site deployment, and quality 'green' products, ZTE's project team is now highly regarded by MTN Cameroon: "ZTE's solar-powered solution has greatly reduced our TCO just as we expected. This consolidated our confidence in widely deploying green solar-powered base station sites and effectively improving our competitiveness," said Mr. Deffo, manager of power supply. MTN Cameroon has again invited ZTE to bid for the second phase of its solar-powered site construction project.

ZTE's solar-powered solution not only helped MTN Cameroon save its investments, but also helped it fulfil its Corporate Social Responsibility (CSR) goals. The solution has expanded wireless coverage and allowed people living in remote areas to enjoy the convenience and benefits of mobile communication.



On-site Engineers from MTN Cameroon and ZTE

The Solar-Powered Site Being Constructed for MTN Cameroon

EFY Times

ZTE Charters Strong Growth Story in India

April 14, 2010,
Source: EFYTimes

ZTE, a leading global provider of telecommunications equipment and network solutions, today announced a record breaking performance in the last fiscal in India, despite a challenging economic environment.

The company registered a strong growth of 50% increase in sales reiterating its leadership position in the Indian telecom market.

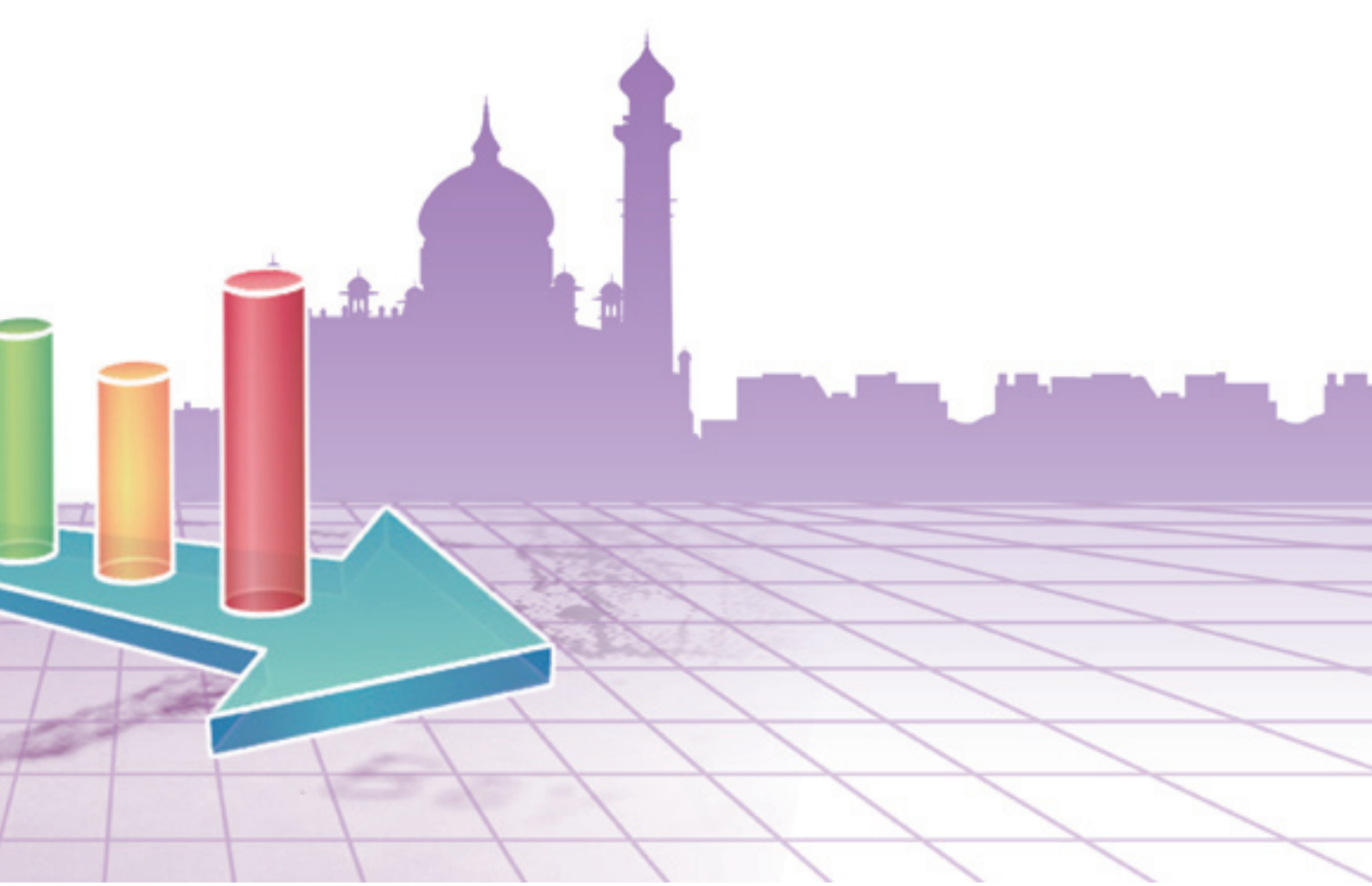
ZTE currently enjoys over 75% market share for NGN products and is also the market leader in CDMA category. Additionally, ZTE experienced large-scale growth coming from the GSM space in India. There was a growth of 50% in the India workforce over last year's total head count which translates to 10% of the total global hires last year by ZTE Corporation.

Key data released by ZTE supports the impressive growth story and provides proof-points of company's multi-fold investments in the Indian market for 2010. Underlining their commitment to the Indian market, the primary areas of focus for ZTE in the coming years would be diverse product strategy powered by innovative technology, workforce development and extended presence in the country through new touch points.

ZTE: Best Fit for Powering the Indian Telecom Industry

The Indian telecom sector is experiencing revolutionary growth and is poised at a crucial turning point with the 3G wave. To meet the evolving requirements of the industry, ZTE plans to make targeted investments in the 2G, 3G, bearer network and fixed line broadband in the Indian market. In a 3G focused environment, the UTMS market size is expected to be around 50 billion dollars while the WiMAX segment will be to the tune of 20 billion dollars.

In the WiMAX arena, ZTE has emerged as a strong contender having already made successful in-roads in the Indian 3G market with its BSNL WiMAX win in 2009. In the UTMS product space, ZTE's SDR solutions have surfaced as the most compelling offering for the operators today. The SDR solutions enable a smooth evolution from 2G to 3G, and are cost-effective, giving ZTE an edge over the intense competition in the market. Given its proven track record in creating a successful 3G experience in China, coupled with the understanding of the local market dynamics and technology expertise, ZTE proves to be the best fit to partner India in building its 3G networks.



"This growth story is a result of our continued and strong commitment in the India Market. Having seen many phases of growth and challenges, I am proud to announce this continued momentum. Our firm foundation, core technology capabilities and strategic priorities were instrumental in driving our sustained success," said Dr. D.K. Ghosh, Chairman and Managing Director, ZTE India Pvt. Ltd. He further added, "We are well placed to lead the emerging wave of technology that the telecom industry will see in the form of 3G. As we work towards our strategic vision, we promise to support India every inch of the way in traversing this journey successfully."

Strengthening India Linkages

The company is ready to ride on the 3G wave to promote its offerings in the space of data card and mobile handsets market. Additionally, on the engineering front ZTE India will focus on enhancing project delivery capacity. Some of the key initiatives include:

- Establishment of technical support departments, building a core team of 600 people to capitalize on local technological capabilities;
- Introducing a new line of leadership at the regional level for each circle to facilitate targeted capacity building;
- Increased external contractors training and capacity building;
- Logistics control.

Creating Value for the Ecosystem: Validating Continued Importance of India

ZTE aims to create value for the ecosystem by continuous knowledge transfer in the Indian market and generate opportunities for employment. The attempt is to focus on quality in order to bring together a high performing talent group. The company aims to keep the staff training rate over 80%. Additionally, in the first half of 2010, it plans to train 314 product experts in the 2G and 3G domain for its India Engineering Centre.

The company also unveiled its plans to set-up its local laboratory in India along with a local after-sales staff to effectively manage projects. Efforts are also on to build the Network Operation Center (NOC) line of business to provide managed services, operation and maintenance for projects. To support this initiative, ZTE plans to additionally hire around 800 employees as technical staff in India in the current year.

China's ZTE Q1 Net Profit Up 40%, Beats Forecast

Q1 Net Profit 109.9 Million Yuan vs 105.5 Million Yuan Forecast

April 27, 2010 Source: Reuters
Reporting by Melanie Lee; Editing by Doug Young and Edmund Klamann

- Terminal sales, including 3G handsets, up 42% year on year
- Sees rising opportunities in overseas markets

ZTE, China's No.2 telecom equipment maker, posted a 40% jump in first-quarter profit, beating expectations, on growing exports and a continued 3G handset binge at home.

ZTE said the effects of the financial crisis were waning and it was seeing more opportunities in international markets.

It attributed its robust results to strong growth in the terminals segment, which includes 3G handsets, with sales rising 41.8%. Its carrier network segment remained flat.

Analysts said reduced spending by China's three wireless carriers on 3G networking equipment this year should be offset by growth in third-generation handset sales as more people sign on to the higher-end service.

ZTE told Reuters earlier in the month that it also expected overseas sales growth to pick up this year after a sluggish 2009, amid an export drive as 3G sales remain flat in its home market.

ZTE reported its first-quarter net profit rose 39.7% to 109.9 million yuan ($16.1 million) compared with 78.7 million yuan a year earlier. The result beat analysts' expectation of 105.5 million yuan, according to the average of two analysts polled by Reuters.

Revenue for the quarter ended March came in at 13.3 billion yuan compared with 11.7 billion yuan a year ago.

Shenzhen-based ZTE's 2009 revenue jumped 36% to 60.3 billion yuan, fuelled by China's spending binge on 3G infrastructure.

Last December, China's telecom regulator said domestic investment in 3G systems reached $21 billion in 2009. ZTE Chairman Hou Weigui, whose company won about 36% of China's 3G contracts, told Reuters earlier this month he expected 3G spending in China to stay roughly the same this year.

ZTE's shares tumbled 12% in early March after the nation's three major wireless carriers announced 2010 spending plans that were lower than expected.

Its shares have recouped some of those losses since then, and are down about 2.8% this year, in line with a 2.8% fall in the broader Hong Kong market.

ZTE Records 60 Million Wireless Terminal Shipments, Representing over 33% Growth over 2008

40 million handsets and 20 million data cards shipped

7 April 2010, Shenzhen, China — ZTE experienced impressive growth in 2009 in its wireless terminals space. According to iSuppli, ZTE shipped 60 million wireless terminals including more than 40 million handsets and 20 million data cards in 2009. More than 70% of all ZTE shipments in 2009 were to international markets, in line with the company's aggressive global growth strategy.

In wireless terminals, ZTE's shipment of 60.17 million units represented a 33% growth over 2008. In 2009, ZTE began to break into the three major high-end markets including Europe, North America and Japan, partnering with the top global operators in the wireless terminal area, including VDF, T-Mobile, Verizon, Telefonica, Orange, H3G, Telenor, TIM and Sprint. The sale of products ranged from high-end and innovative, personalized products to value priced products.

ZTE Sells World's Fastest HSPA+ 28.8M Data Card with Greece's COSMOTE

19 April 2010, Shenzhen, China — ZTE announced today it has started selling world's fastest HSPA+28.8M data card with COSMOTE in Greece, moving the industry forward with record speeds for mobile broadband services by using advanced HSPA+MIMO technology. COSMOTE became the first company in Greece to offer 28.8Mbps with its "COSMOTE Internet on the Go" data transfer package—the country's most popular mobile broadband offering. The new speeds are available through the updated ZTE MF662 data card, which is offered for free through select "COSMOTE Internet on the Go" plans.

By deploying advanced HSPA+MIMO technology with the MF662, COSMOTE's customers can enjoy up to 28.8Mbps download speed and 5.8Mbps upload speed for easy access to the Internet, wherever and whenever they want. Users can enjoy rich content and online applications, including video content, and high transmission of large files including photographs, data files, music, and more.

ZTE and Vivo Unveil World's First Low-Cost Handset with Digital TV in Brazil

21 April 2010, Rio de Janeiro, Brazil — ZTE today announced the Brazilian launch of the new handset N290, a low-cost cell phone with digital TV in Brazil.

Available exclusively through Vivo, the mobile phone will be available in Rio de Janeiro and São Paulo from this week, priced at BRL 399 for the pre-paid version and BRL 199 for the post-paid plan. It will be available in other Brazilian cities in coming weeks where Digital TV signals are just available.

The ZTE N290 incorporates an MF645 3G modem for Digital TV reception, and supports Vivo's strategy to bring mobile Digital TV to its customers in time for the World Cup in South Africa in June.

With a 3.2 inch widescreen, the handset works with the Brazilian TV digital system ISBD-T which allows the access to all digital open channels at no cost. The new handset also features a 2.0 MP camera and supports a Maxim 8G TF card.

ZTE Hosts IEEE 10G-EPON Interoperability Showcase

Industry's first commercial demonstration of symmetric 10G PON technology in a multi-vendor, interoperable environment

22 April 2010, Shanghai, China — Interoperability of symmetric 10G-EPON products was demonstrated successfully in Shanghai, China during a showcase hosted by ZTE. The showcase was open to participants of the IEEE 1904.1 Working Group meeting in Shanghai.

Interoperability among products was successfully demonstrated by four vendors: Broadcom, PMC-Sierra, Opulan and ZTE. Each vendor supplied an OLT and a variety of ONUs (supporting both 1G-EPON and symmetric 10G-EPON), connected in a multi-vendor configuration to demonstrate complete interoperability.

System performance was examined for a number of realistic and challenging test configurations that reflected the specific requirements of major service providers. These tests included physical-layer connectivity, MAC-layer connectivity, MPCP discovery, dynamic bandwidth allocation, service setup, security and authentication, and connection management.

ZTE to Build IMS Core Network for China Mobile

26 April 2010, Shenzhen, China — ZTE announced it has been chosen by China Mobile to deliver its IMS core network in key Chinese provinces. The China Mobile's commercial IMS network will boast 1.4 million lines when it is completed in three months. According to the comprehensive evaluation process by China Mobile, ZTE was ranked among the tier one IMS supplier group for the project this time.

Based on ZTE's full package of IMS core network products, the network will enable China Mobile to quickly launch the various fixed/mobile convergence services such as Converged Centrex, Converged One Number, Multimedia CRBT and Converged Conferencing, further enhancing the user experience.

ZTE Supports Aid Efforts into Quake-Hit Zones

16 April 2010, Shenzhen, China — A 7.1-magnitude earthquake struck Yushu County, Yushu Tibetan Autonomous Prefecture of China's Qinghai Province on April 14, 2010. The communication equipments there have been seriously affected.

Immediately after the earthquake, ZTE established a disaster relief team for providing aid efforts for the quake-hit zones. The first batch of technical experts arrived at the quake-hit zones on April 14, assisting each operator in solving the problems on the telecommunication equipments.

At the same time, ZTE has urgently reorganized the spare part inventory all over the country, and the Logistics Department and Network Service Center have worked out emergency plans and determined emergency receivers for providing overall supporting for the front, guaranteeing the timely arrival of the spare parts required for the network maintenance and supporting the telecommunication recovery of the quake-hit zones.

ZTE Partners with CMCC for Ground-Breaking TD-LTE Indoor MIMO Networking Performance Test

29 March 2010, Shenzhen, China — ZTE announced that, together with China Mobile Communications Corporation (CMCC), it has successfully completed a TD-LTE indoor MIMO networking performance test in Beijing - producing the world's first batch of TD-LTE performance evaluation data on indoor single/dual path cell throughput. The testing also produced data for indoor multi-UE circumstances.

The test evaluated the construction solution of indoor distribution systems, including whether a two-path system can achieve significant better performance than a single path system under different scenarios and user distributions. Organized by CMCC, ZTE based its results on comparative tests under several different scenarios. The testing found that, under diversified testing circumstances, a TD-LTE two-path indoor distribution system downlink throughput does show dramatic improvements compared with single path indoor distribution system. The data is valuable for the industry for TD-LTE networking construction and efficiency.

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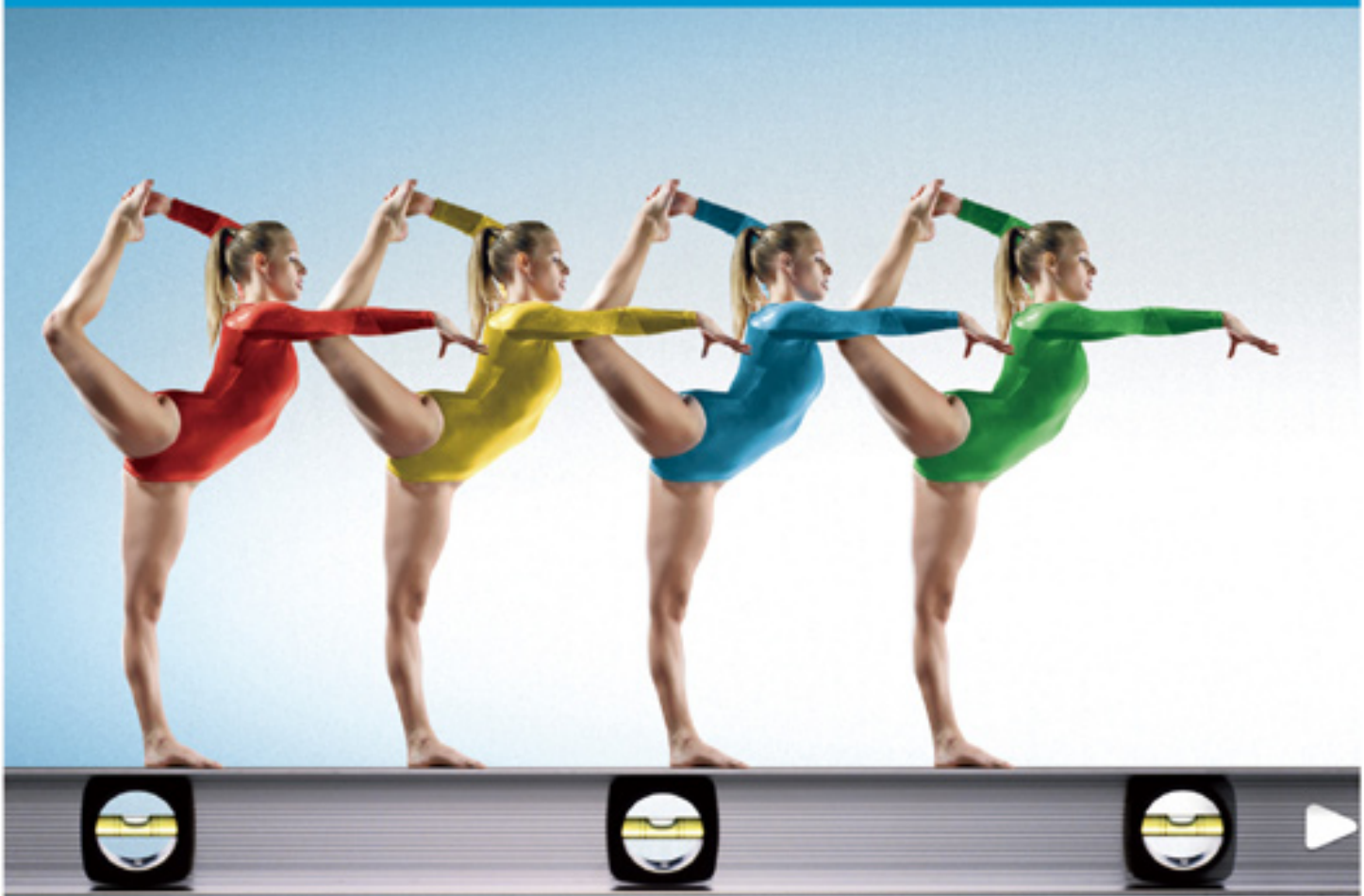

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