

BROADBAND IN VIETNAM

FORGING ITS OWN PATH



BROADBAND IN VIETNAM

FORGING ITS OWN PATH



AN *infoDEV* PUBLICATION PREPARED BY:
Tran Minh Tuan
2011


infoDev
Information for
Development Program

© 2011 The International Bank for Reconstruction and Development / The World Bank
1818 H Street NW
Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org
E-mail: feedback@worldbank.org

All rights reserved

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *infoDev*, the Donors of *infoDev*, the International Bank for Reconstruction and Development/The World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this publication is copyrighted. Copying and/or transmitting portions or all of this work without permission may be a violation of applicable law. The International Bank for Reconstruction and Development/The World Bank encourages dissemination of its work and will normally grant permission to reproduce portions of the work promptly.

For permission to photocopy or reprint any part of this work, please send a request with complete information to *infoDev* Communications & Publications Department; 2121 Pennsylvania Avenue, NW; Mailstop F 5P-503, Washington, D.C. 20433, USA; telephone 202-458-4070; Internet: www.infodev.org; E-mail: info@infodev.org.

All other queries on rights and licenses, including subsidiary rights, should be addressed to the Office of the Publisher, The World Bank, 1818 H Street NW, Washington, D.C. 20433, USA; fax: 202-522-2422; e-mail: pubrights@worldbank.org.

Cover design by *infoDev*

To cite this publication:

Tuan, Tran Minh, 2011. *Broadband in Vietnam: Forging Its Own Path*. Washington, D.C: *infoDev* / World Bank. Available at <http://www.broadband-toolkit.org/>.

Table of Contents

| | |
|---|----|
| Table of Contents | iv |
| List of Figures, Tables and Boxes | v |
| Acknowledgments | vi |
| Executive Summary | 7 |
| 1. Country background | 8 |
| 1.1 Geographic and population conditions..... | 8 |
| 1.2 Macro-economic environment..... | 8 |
| 2. Broadband policy, regulatory framework and institutional framework in Vietnam | 10 |
| 2.1 Policy framework..... | 10 |
| 2.1.1 Direction of ICT development..... | 10 |
| 2.1.2 Policy of broadband development..... | 11 |
| 2.1.3 Operator ownership guidelines..... | 11 |
| 2.1.4 Technology guidelines..... | 12 |
| 2.1.5 Service guidelines..... | 13 |
| 2.2 Institutional structure..... | 13 |
| 2.2.1 Government institutions involved in broadband..... | 13 |
| 2.2.2 Major telecom operators..... | 13 |
| 2.3 Conclusions..... | 16 |
| 3. Broadband technologies and market in Vietnam | 17 |
| 3.1 Broadband infrastructure..... | 17 |
| 3.1.1 Structure of broadband network in Vietnam..... | 17 |
| 3.1.2 Fixed broadband technologies..... | 18 |
| 3.1.3 Wireless broadband technologies..... | 18 |
| 3.2 Status of broadband market in Vietnam..... | 19 |
| 3.2.1 Fixed broadband..... | 19 |
| 3.2.2 Wireless broadband..... | 20 |
| 4. Rural broadband strategies | 23 |
| 4.1 Delta and midland rural areas..... | 23 |
| 4.2 Extreme poverty rural areas..... | 24 |
| 4.2.1 Communal P&T and Cultural Points..... | 24 |
| 4.2.2 Universal telecommunication services program..... | 25 |
| 4.3 Future plans..... | 26 |
| 5. Analysis of broadband success and challenges in Vietnam | 27 |
| 5.1 Social-economic characteristics..... | 27 |
| 5.2 Technological capability..... | 27 |
| 5.3 Conclusion and lessons learned..... | 28 |

List of Figures

| | |
|--|----|
| Figure 1-1: Map of Vietnam..... | 8 |
| Figure 1-2: Literacy and years of adult schooling, ASEAN, 2010..... | 9 |
| Figure 2-1: VNPT Group..... | 14 |
| Figure 3-1: Vietnam’s international Internet bandwidth..... | 18 |
| Figure 3-2: Fixed broadband and subscriptions per 100 people in Vietnam and Asia, 2010..... | 20 |
| Figure 3-3: VNPT ADSL packages and ADSL entry level prices, selected countries, USD, 2011... | 20 |
| Figure 3-4: Mobifone 3G prices and monthly 3G prices, selected countries, USD, 2011..... | 22 |

List of Tables

| | |
|--|----|
| Table 2-1: Objectives for making Vietnam a leading ICT country..... | 11 |
| Table 2-2: Allocation of major responsibilities in telecommunications policy..... | 14 |
| Table 2-3: Main telecommunications operators in Vietnam..... | 15 |
| Table 3-1: 4G trial..... | 19 |
| Table 3-3: 3G (WCDMA) obligations of mobile operators..... | 21 |
| Table 4-1: Telecommunications services development in delta and midland areas..... | 23 |

List of Boxes

| | |
|---|----|
| Box 2-1: Hanoi Telecom: From CDMA to GSM..... | 11 |
| Box 3-1: TOPIC64..... | 21 |

Acknowledgements

This report was drafted by Tran Minh Tuan with significant contributions by Michael Minges, who directed the case studies of the Broadband Strategies Handbook. Victor Mulas, Dzung The Nguyen and Christine Zhenwei Qiang also provided valuable comments. The supervision of Tim Kelly (infoDev) and Carlo Rossotto (TWICT), for their direction on the overall project, is also acknowledged, as is Samhir Vasdev for editing and preparing the document for publication.

The Handbook and its case studies are generously funded by the Korean Trust Fund (KTF) on Information and Communications for Development (IC4D). The KTF is a partnership between the government of the Republic of Korea and the World Bank Group whose purpose is to advance the ICT4D agenda to contribute to growth and reduce poverty in developing countries. The KTF, as well as Philippe Dongier, Sector Manager (TWICT) and Valerie D'Costa, Program Manager (infoDev), are owed the author's gratitude for their support and guidance on this project.

Executive Summary

With some 86 million inhabitants, Vietnam is the 13th most populated country in the world. Its land area is larger than Italy and almost the size of Germany. Wireline broadband has grown over 1,000 percent since 2005 and with 3.6 million subscriptions in 2010, it had the ninth largest network among developing countries. Its wireline broadband penetration is the sixth highest among lower middle-income economies with 4.4 subscriptions per 100 people.

Solid economic growth has coincided with increased broadband usage. Liberalization of the telecommunications sector has led to growing competition with 11 enterprises providing infrastructure. Service providers have developed modern IP-based networks with extensive fiber optic backbones. Incomes have risen so that more people can afford broadband. This in turn has created a virtuous circle with explosive demand creating a larger market, resulting in economies of scale and lower prices. Another factor driving fixed broadband growth is that Vietnam was a latecomer to the IMT-2000 WCDMA mobile broadband technology. Major mobile operators did not launch their networks until 2009 with around 15 percent of mobile subscribers having WCDMA capability towards the end of 2010.

Despite these successes, Vietnam faces challenges broadening broadband access, particularly in rural areas where some 70 percent of the population resides. Young people in urban areas “live” with high-speed Internet access; however, less than one percent of rural households had any type of Internet access in 2008.

Most businesses are focused on using the Internet for basic needs such as email and finding information while more advanced applications such as e-commerce are not used as widely. Despite rising Internet access in

households, many users have yet to fully exploit broadband applications. Survey data indicate that the use of a computer’s Internet connection in Vietnam is to search for personal information and serve children’s learning. The lack of relevant content and fragmented information are problems; a public information network with a unified portal, equipped with an automatic translation engine and rich multimedia content covering health, education, culture and agriculture is lacking.

The cost of fiber optic access is only economical in new urban areas and for large enterprises so DSL remains the fixed broadband choice of households. But copper lines provide less quality than fiber and it is difficult to upgrade the transmission capacity. At the same time, telecom enterprises have been lately focusing on developing mobile broadband subscribers to the detriment of the fixed network.

The large number of operators has led to overlap in investment in the access network. Interconnection is difficult because operators use a variety of technologies, impacting standardization of the national telecommunications infrastructure. Intense competition has resulted in price wars threatening long-term sustainability. Service providers are looking to reduce duplication by cooperating on shared infrastructure but so far no specific measures have been implemented.

While Vietnam has made tremendous achievements in broadband, there are challenges arising from its rapid growth: (i) development of the width (e.g., the number of subscribers) needs to be coupled with development of depth (e.g., service quality); (ii) differences in the level of broadband between regions can contribute to widening gaps; and (iii) the rapid development of broadband can cause policy problems affecting social life, security, and politics.

1 Country background

1.1 Geographic and population conditions¹

The Socialist Republic of Vietnam is located in Southeastern Asia. Its eastern and southern boundaries are largely coastline. To the north is China; Laos and Cambodia are to the west. Vietnam is approximately 331,688 km² in area (not including the Hoang Sa and Truong Sa islands), larger than Italy and almost the size of Germany. The topography consists of hills and densely forested mountains, with level land covering no more than 20%.



Figure 1-1: Map of Vietnam

The result of the 2009 Census found the population of Vietnam to be 85.8 million on April 1. The Kinh are the dominant ethnic group numbering 73.6 million, accounting for 85.8% of the population. Their population is concentrated in the alluvial deltas and coastal plains of the country. There are 54 ethnic minority groups throughout the country. Most ethnic minorities, such as the Muong, closely related to the Kinh, are found mainly in the highlands covering two-thirds of the territory. The Hoa (ethnic Chinese) and Khmer Krom are mainly lowlanders. The largest ethnic minority groups include the Hmong, Dao, Tay, Thai, and Nung.

There are 63 provinces and centrally administered cities grouped into eight regions: Red River Delta, Eastern North Vietnam, Western North Vietnam, Northern Central Vietnam, Southern Central Vietnam, Southern Central Highlands, Eastern South Vietnam and Cuu Long River Delta. Some 70% of the population resides in rural areas. The lowest administrative division is the commune of which there are 9,121.

The 2009 Census found the literacy rate for the population aged 15 and older to be 94.0%, up from 90.3% in 1999. This ranks Vietnam fourth among the Association of South East Nations (ASEAN) (Figure 1-2, top). However the United Nations Development Programme calculates that Vietnamese ages 25 and older have on average only 5.5 years of schooling, one of the lowest rates in ASEAN (**Error! Reference source not found.**, bottom).

1.2 Macro-economic environment

Historically, Vietnam has been an agricultural civilization based on wet rice cultivation. The Vietnam War destroyed much of the country's economy. Upon taking power, the Government created a planned economy for the nation. Collectivization of farms, factories and economic capital was implemented, and millions of people were put to work in government programs. For a decade, united Vietnam's economy was plagued by inefficiency, underproduction and restrictions on economic activities. It also suffered from the trade embargo by the United States and most of Europe after the Vietnam War. Subsequently, trade partnerships with the Communist bloc began to erode.

¹ This section is largely derived from the web sites of the General Statistics Office of Vietnam (<http://www.gso.gov.vn>) and the Embassy of the Socialist Republic of Vietnam in the United States of America (<http://www.vietnamembassy-usa.org>).

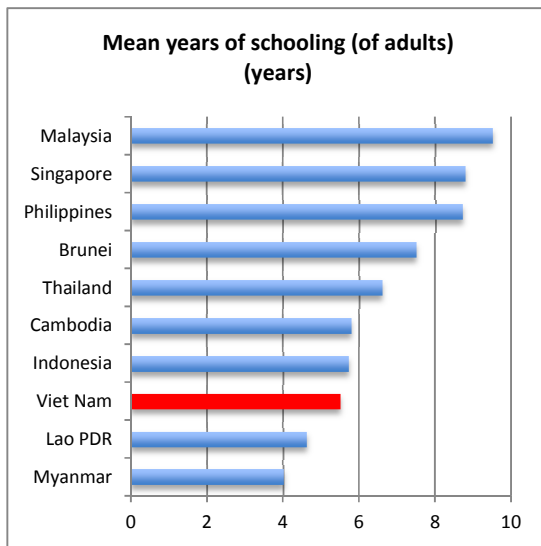
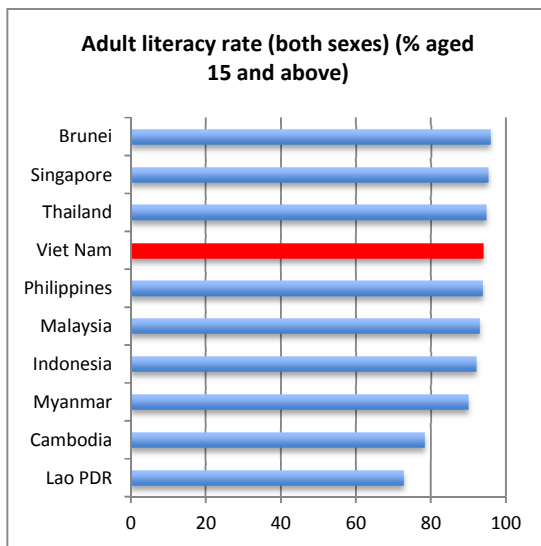


Figure 1-2: Literacy and years of adult schooling, ASEAN, 2010 (Source: UNDP, Human Development Report Indicators)

In 1986, the Sixth Party Congress introduced significant economic reforms with free market economy elements as part of a broad economic reform package called "đổi mới" (Renovation), resulting in a Socialist-oriented market economy. Private ownership was encouraged in industry, commerce and agriculture.

In 2010, the nominal GDP reached US\$ 104 billion, with per capita income of US\$ 1,100.² Vietnam achieved around 7.5% annual GDP growth from 1993 to 2002 and continued between 5.3-8.4% a year between from 2003 to 2010, making it one of the world's fastest

growing economies. Growth was 6.8% in 2010. Foreign investment and domestic savings have grown dramatically. Manufacturing, information technology and high-tech industries form a large and fast-growing part of the national economy. Vietnam is a relative newcomer to the oil business, but today it is the third-largest oil producer in Southeast Asia with output of 400,000 barrels per day. Vietnam is one of Asia's most open economies: two-way trade is around 160% of GDP, more than twice the ratio for China and over four times India's.

As a result of several land reform measures, Vietnam is now the largest producer of cashew nuts with a one-third global share, the largest producer of black pepper accounting for one-third of the world's market and second largest rice exporter in the world after Thailand. Besides rice, key exports are coffee, tea, rubber, and fishery products. However, agriculture's share of economic output has declined, falling as a share of GDP from 42% in 1989 to 20% in 2006, as production in other sectors of the economy has risen.

Deep poverty, defined as a percent of the population living under \$1 per day, has declined significantly and is now smaller than that of China, India, and the Philippines. Much can be attributed to equitable economic policy that aimed at improving living standards and preventing the rise of inequality; this included egalitarian land distribution at the initial stages of *đổi mới*, investing in poor remote areas and subsidizing education and health fees for the poor.

Vietnam has applied sequenced trade liberalization, using a two-track approach by opening some sectors of the economy to international markets while protecting others. Vietnam was accepted into the World Trade Organization (WTO) on November 7, 2006. Among steps taken in the process of transitioning to a market economy, Vietnam has updated its intellectual property legislation to comply with the WTO's Trade-Related aspects of Intellectual Property (TRIPS).

² <http://data.worldbank.org/country/vietnam>

2 Broadband policy, regulatory framework and institutional framework in Vietnam

2.1 Policy framework

There is no specific definition of broadband in Vietnam. The concept of broadband therefore can vary depending on the circumstances and level of development. When narrowband connections are no longer used as a regular service, there will certainly be a changing of broadband concept.

Currently, Vietnam does not have specific legal documents related directly to broadband. However, telecommunications and Internet development strategies often refer to building the information society based on a modern broadband network infrastructure to meet the economic, political, national security and welfare needs of society.

The legal framework is being modified to institutionalize the market-opening policy and create a fair, just and equal competition environment to match the convergence trend of technology and service.

Major telecommunications and broadband related legal documents are:

- Telecom Law No. 41/2009/QH12 dated December 04, 2009 of the National Assembly and effective from July 01, 2010;
- Radio Frequency Law No. 42/2009/QH12 dated December 04, 2009 of the National Assembly and effective from July 01, 2010;
- Decree No. 25/2011/ND-CP dated April 06, 2011 of the Government detailing and guiding the implementation of a number of articles of the Telecom Law;
- Decree No. 97/2008/ND-CP dated August 28, 2008 of the Government on managing, supplying and using of Internet service and e-information on the Internet;
- Decision No. 158/2001/QĐ-TTg dated October 18, 2001 of the Prime Minister approving of The Vietnam Post and Telecommunications Development Strategy to 2010 and through 2020;

- Decision No. 246/2001/QĐ-TTg dated October 06, 2005 of the Prime Minister approving The Information and Communications Technology Development Strategy to 2010 and through 2020
- Decision No. 1755/QĐ-TTg dated September 22, 2010 of the Prime Minister approving The Project “Making Vietnam to soon become a strong country in the field of information technology and communications”;
- Decision No. 32/2006/QĐ-TTg dated February 07, 2006 of the Prime Minister approving The Master Plan of Telecommunications and Internet Development to 2010;
- Direction No. 04/2008/CT-BTTTT dated May 22, 2008 of the MIC Minister on Management and development telecommunications infrastructure.

2.1.1 Direction of ICT development

In recent years, Vietnam has issued several breakthrough directives to promote the development of the ICT field. In that respect some have been institutionalized, including Decision No. 1755/QĐ-TTg dated September 22, 2010 of the Prime Minister “Approving the Scheme to Early Make Vietnam a Country Strong in Information and Communication Technologies.”³ This decision sets out the country’s vision and targets for becoming a leading ICT nation by 2020. It envisions several economic and social goals including:

- Internationally recognized ICT human resources
- Software and Digital Content Industry becoming a key driver of the economy
- Nation-wide broadband infrastructure
- ICT usage in all aspects of life, contributing to sustainable development and enhancing the transparency of the government agencies.
- Annual ICT revenue growth rate doubles the GDP growth rate.

³ <http://lawfirm.vn/?a=doc&id=2083>

| Human resources | ICT industry | Broadband infrastructure | Universalizing information | ICT usage | ICT business and market development |
|---|--|---|--|--|---|
| <ul style="list-style-type: none"> - 80% of students of ICT graduated from universities qualified in both English and professional skills to join international labor market. - Total number of people working in ICT industry reaches 1 million including domestic and international markets. - 70% population using the Internet | <ul style="list-style-type: none"> - Formed research institutions - to develop a strong ICT. - Vietnam is among 10 leading countries providing outsourcing services and digital content. - The software industry and IT-based services become the industry's fastest growing industries in the economic - technical high proportion of GDP. | <ul style="list-style-type: none"> - Broadband network to almost of the villages throughout the country; - Mobile broadband coverage to 95% of the population; - Vietnam ranks 55 or higher in the rankings of the ITU (group of one third leading countries). | <ul style="list-style-type: none"> - Most households have telephones. - 50-60% of households across the country have computers and broadband internet access. - Most households have television capable of watching digital channels in different ways. | <ul style="list-style-type: none"> - Vietnam is in the group of one third leading countries in the ranking of the United Nations about e-government readiness. - Most basic public services are provided online to citizens and business at the integrated level (online payment, online results, etc.). | <ul style="list-style-type: none"> - Improving the performance of Vietnamese ICT enterprises and corporations in both service and manufacturing sectors. - Vietnamese ICT businesses operate at ASEAN and world scale, of which some having total revenues up to \$ 15 billion. |

Table 2-1: Objectives for making Vietnam a leading ICT country

- In 2020, ICT share in GDP reaching 8-10%

In addition to objectives in a number of areas (Table 2-1), the decision also establishes several broadband targets:

- Up to 2015: Basically complete the broadband network to communes nationwide, connect all schools to Internet; mobile broadband signal to cover 85% of the population;
- Up to 2020: Complete the broadband network to most of the villages; mobile broadband signal to cover 95% of the population;
- Up to 2015: 20 - 30% of households have computer and broadband Internet access;
- Up to 2020: 50 - 60% of households have computer and broadband Internet access, in which 25 - 30% use fiber optic cable;
- Up to 2015: provide most of basic online public services to citizens and

enterprises at level 2 and level 3 (download forms, interchange information and send/receive records through the network);

- Up to 2020: Most of basic public services are online provided to citizens and businesses at level 4 (service fee payment, receive results of service online).

2.1.2 Policy of broadband development

Vietnam does not have a separate broadband development policy. However, through the directions of ICT development, broadband is covered in the specific policies relating to network infrastructure, technology of providing services and contents for socio-economic development.

2.1.3 Operator ownership guidelines

Decree No.25/2011/ND-CP provides enterprises regulations in the field of

telecommunications.⁴ The decree specifies new guidelines for the execution of several articles of the Telecommunication Law relating to ownership ratios, foreign investment, fees and authorized capital. The ownership ratio limitation has impacted the two large mobile networks in Vietnam.

Pursuant to this new decree, an organization or individual who owns over 20 percent of the charter capital or stake in one telecommunications company will not be allowed to hold more than 20 percent of the charter capital or stake in other telecommunications firms operating in the same services.

Due to this regulation, one of the major telecommunications operators in Vietnam, the Vietnam Post and Telecommunication Group (VNPT), is in a dilemma. VNPT Group, which currently owns 100 percent capital of the two big mobile networks Mobifone and Vinaphone, may be forced to sell one of the two networks or merge its two affiliates into one in order to be in accordance with the new rules. At present, there still has not been an official plan or solution submitted by VNPT to the Ministry of Information and Communication (MIC) on this matter. While the merger plan has not been proposed, it is said that schedule of equitizing Mobifone has been determined and VNPT is going to announce and implement the plan that has been delayed for quite a long time.

As per Clause 4.2 of Decree No.25/2011/ND-CP, although full foreign ownership of an operator in the Vietnamese telecom sector is not allowed, overseas investors can enter into business cooperation contracts or joint ventures with licensed Vietnamese operators.

2.1.4 Technology guidelines

Regulatory policies related to broadband infrastructure are relatively neutral. Nevertheless, Vietnam is not a technology producer but rather a technology-applying nation, so it prefers technologies that have global mass deployment. One of the most important deployment success factors is that the network equipment is inexpensive and advanced and that terminal devices are diverse with a reasonable price. In addition, application of common technologies will allow Vietnam to have better and deeper

international exchange and cooperation (roaming from Vietnam to other countries and vice versa).

For new technologies, the MIC reviews trends applied in the world, develops appropriate frequency planning and make standards and recommendations for enterprises to follow. MIC suggests that enterprises apply new technologies used in advanced countries. There will be a trial license issued by MIC for a certain period in specified areas before allowing mass deployment. There is a risk in wasted investment or even bankruptcy if the selected technology does not achieve widespread market acceptance. One example is Hanoi Telecom that has to

Hanoi Telecom launched its CDMA network in November 2006 and started deploying its services in January 2007. The operator has installed about 800 base stations throughout the country and has invested US\$656 million towards its platform, making it one of the largest telecoms projects in Vietnam. By the end of 2007, Hanoi Telecom's mobile service, HT Mobile, was reported to have just fewer than 200,000 customers. Disappointed with its progress, Hanoi Telecom started to migrate its subscribers to a GSM network offering from April 2008. The operator signed its single largest contract with Ericsson in September 2008, to migrate its network from CDMA to GSM/EDGE technology at a cost of US\$450 million. As part of a three-year agreement, the vendor will be responsible for the management, operation and network design of Hanoi Telecom's mobile network. The operator re-launched its mobile services under the name of Vietnamobile.

Customers choosing to stay with HT Mobile will receive a new GSM handset. However, those who choose to retain CDMA service will be switched to the CDMA network of mobile operator S-Fone. HT Mobile decided to implement the transition after failing to reach its target of 1 million customers by the end of 2007.

Source: BMI Vietnam Telecommunications Report Q2/2011

Box 2-1: Hanoi Telecom: From CDMA to GSM

⁴ "Detailing and Guiding a Number of Articles of the Law on Telecommunications." Available at <http://asemconnectvietnam.gov.vn/lawdetail.aspx?lawid=1938>

convert to GSM technology after deploying a nationwide CDMA network (Box 2-1).

2.1.5 Service guidelines

Services based on broadband infrastructure are regulated by the content of the service. Regulations differ depending on the service such as: online gaming, distance learning, banking and e-commerce transactions, etc.

Online gaming services are being managed carefully regarding content and technical conditions to ensure that the youth are not addictive and it matches recreational needs of users.

Content services are not diverse and abundant at the present. This relates to promotion policy of the enterprise and also relates to the improving ICT skills for users policy.

2.2 Institutional structure

2.2.1 Government institutions involved in broadband

As with most governments, setting policy for a complex sector like telecommunications requires action from multiple ministries and agencies. Given the complexity of the telecommunications sector and its impact on the entire economy, Vietnam's policy-making includes multiple organizations (Table 2-2).

2.2.1.1 The Ministry of Information and Communications (MIC)

The Ministry of Information and Communication (MIC) was created in 2007 from its predecessor, the Ministry of Post and Telematics as well as several departments from the Ministry of Culture and Information. The MIC is responsible for both policy and regulation. Its mandate covers a range of fields including press; publishing; posts; telecommunications and Internet; radio frequency; information technology; electronics; broadcasting and management of public services on behalf of the government.

MIC's main functions include submitting drafts of laws, ordinances, regulations, strategies and development plans to the Government. It also provides guidance on the implementation of laws, ordinances and regulations as well as development strategies and plans.

The *Viet Nam Telecommunications Authority* (VNTA) was established under the MIC by merging two units under the former Department

of Telecommunications and Authority of Information and Communications Technology Quality Control, in August 2011.⁵ The VNTA assumes regulatory activities including advice on management of the telecommunications sector on a national scale. Specifically, the VNTA will focus on monitoring the implementation of the commitments of operators and supervision of infrastructure development. The VNTA will also be the focal point for management, supervision and inspection of regulations on tariffs and quality of service as well as telecommunications sector promotion. Competition issues, disputes and complaints between operators in the telecommunications sector shall also be reviewed by VNTA.

The *Vietnam Internet Network Information Center* (VNNIC) is a government agency under the MIC established in 2000. It manages the country's Internet resources including domain names, addresses, and autonomous system numbers as well as the Vietnam National Internet eXchange (VNIX).

2.2.2 Major telecom operators

Vietnam has a high degree of competition in its telecommunication sector with a number of operators providing services (Table 2-3). Eight provide fixed telephone services, seven offer 2G mobile services and five offer 3G services. In addition there are 90 licensed Internet Service Providers (ISPs) although the top five control 99% of the market. Most operators are owned by the government or state-owned corporations. Some have foreign partners although the structure of the investment is often not straightforward.

2.2.2.1 Vietnam Posts & Telecommunications (VNPT)

Wholly owned by the government, Vietnam Posts and Telecommunications (VNPT) is the country's main service provider. The group's holdings span a range of activities ranging from telecom services to equipment manufacturing as well as postal and financial services (Figure 2-1). VNPT operates the national backbone network

⁵ Viet Nam Telecommunications Authority.

“Announcement of the establishment of the Viet Nam Telecommunications Authority”, *Press Release*, August 15, 2011.

<http://english.mic.gov.vn/tintucsukien/Trang/AnnoucementofestablishmentoftheVietNamtelecommunicationsauthority.aspx>.

| Agency | Responsibilities |
|--|--|
| Deputy Prime Ministers (DPMs) | Of the five DPMs, one holds the portfolio for telecommunications as an economic sector, one holds the portfolio for ICT as science and technology sector. |
| Office of Government (OOG) | This office serves as the PMs and DPMs secretariat and clearing house, and also coordinates interdepartmental policy and institutional initiatives. OOG also has one department holds the portfolio for telecommunications as an economic sector, one department holds the portfolio for ICT as science and technology sector. |
| Ministry of Information and Communications (MIC) | Sets policy for and regulates the ICT sector; representative of the State's capital interests in facility-based operators. |
| Ministry of Industry and Trade (MoIT) | Sets policy and develops legislation and programs for e-commerce and trade. |
| Ministry of Science and Technology (MOST) | Develops R&D programs for telecommunications and ICT; sets ICT standards. Was formerly the chief policy actor in ICT, but this role was changed with the creation of MIC. |
| Ministry of Planning and Investment (MPI) | Ensures sufficient and timely investment is available for approved development in IT (defined broadly to include telecommunications). |
| National Steering Committee on ICT | Monitors implementation of the national IT plan (which covers telecommunications, ICT, and the ICT projects, functions and responsibilities of all ministries and agencies). |

Table 2-2: Allocation of major responsibilities in telecommunications policy

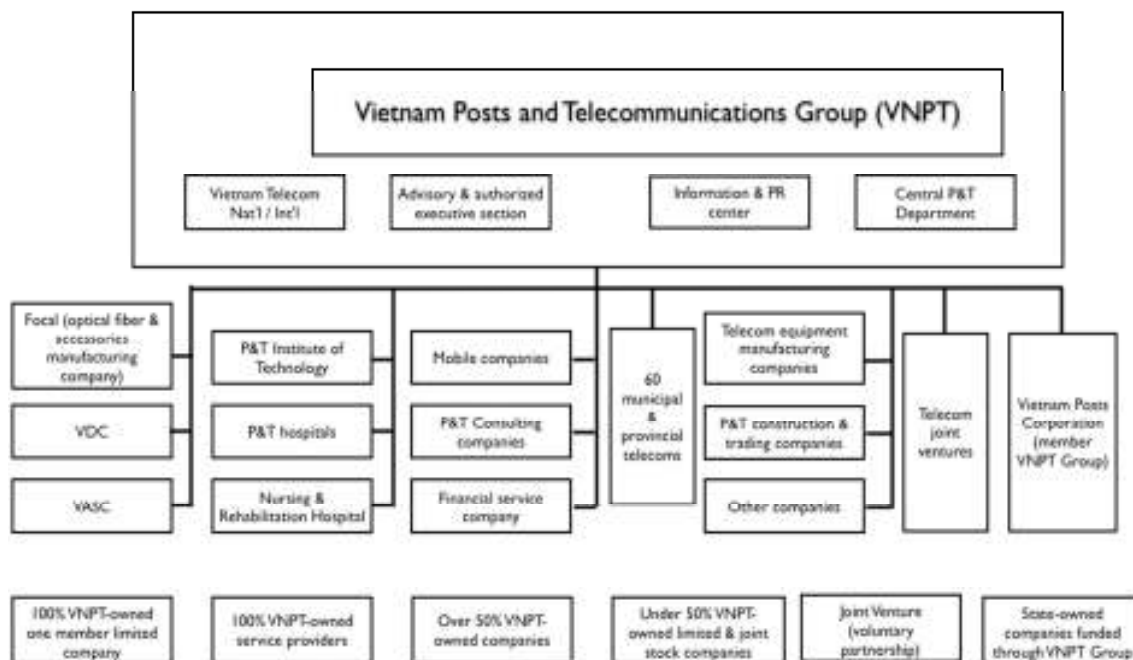


Figure 2-1: VNPT Group (Source: <http://www.vnpt.com.vn/Default.aspx?tabid=212&IntroId=270&temidclicked=270>)

| Operator | Date est'd | Ownership | Services | Market share (2009) | Comment |
|--|------------|--|--|-------------------------|--|
| VNPT | 1995 | Gov't | Fixed Internet | 63.2% 68.6% | Controls mobile operators Mobifone and Vinaphone |
| Viettel | 1998 | Gov't | Fixed GSM Internet 3G | 21.6% 33.8% 11.6% | The operator is looking to expand its presence overseas. Already active in Cambodia, Haiti and Laos, Viettel aims to expand its reach into 15 countries by 2015. |
| Vietnam Mobile Telecom Services (VMS) "Mobifone" | 1996 | Subsidiary of VNPT | GSM 3G | 27.2% | Comvik International under the Sweden Kinnevik had a Business Cooperation Contract ("BCC") with the government to operate Mobifone. The BCC expired in May 2005 and Comvik was unsuccessful in negotiations to convert the BCC to an equity stake. Mobifone plans for a public offering of the company's shares. ⁶ |
| Vinaphone | 1996 | Subsidiary of VNPT | GSM 3G | 27.2% | |
| S-Fone (S-Telecom) | 2003 | Saigon Postel Corporation (SPT) | CDMA (fixed wireless) CDMA (mobile) Internet | 0.9% 4.7% 1.8% | S-Fone was a BOT between Saigon Postel and SLD, a Singapore-based consortium comprising Korea's SK Telecom, LG Electronics and Dong Ah. In April 2010, SPT acquired control of S-Fone. SPT and SK Telecom changed their business cooperation contract into a JV for managing the Vietnamese operator. SPT will refund the capital invested by SK Telecom and the Korean operator will hold a minority stake in the JV. |
| Hanoi Telecom | 2001 | Hanoi People's Committee and the Vietnam Science Institute | GSM 3G (with EVN Telecom) | 4.1% | Offers mobile through the brand Vietnamobile in partnership with Hutchison Group of Hong Kong, China. |
| EVN Telecom | 2006 | Electricity of Vietnam (EVN) | CDMA (fixed wireless) CDMA (mobile) Internet 3G (with Hanoi Telecom) | 14.3% 0.9% 3.2% | EVN is the largest CDMA operator in Vietnam using the 450 MHz band. |
| FPT | 2003 | Corporation for Financing and Promoting Technology | Internet | 13.7% | |
| GTEL | 2009 | Affiliated with Ministry of Public Security | GSM | 2.2% | Operates GSM network in partnership with Vimpelcom of Russia. |

Table 2-3: Main telecommunications operators in Vietnam (Source: Adapted from operator and MIC information)

⁶ "MobiFone to hold IPO this year." *TeleGeography*, February 17, 2011. <http://www.telegeography.com/products/commsupdate/articles/2011/02/17/mobifone-to-hold-ipo-this-year/>.

that connects the provincial operating companies in 63 cities and provinces and indirectly controls the country's two leading mobile operators, Vietnam Telecom Company (VinaPhone) and Vietnam Mobile Telecom Services (MobiFone), both operating GSM networks. VNPT controls 63% of the fixed telephone market, 54% of the mobile market (through VinaPhone and MobiFone) and 69% of the Internet market.

VNPT owns eight state-affiliated companies, eight joint ventures (with other state-owned enterprises as well as with private entities) and 13 other subsidiaries. In addition to VinaPhone and MobiFone, the state companies include Vietnam Telecom National (domestic services), Vietnam Telecom International (international long-distance services) and Vietnam Data Communication Company (data services).

2.3 Conclusions

Vietnam has made fundamental changes to its legal environment with the objective of creating a robust and competitive telecommunications

sector, which in turn provides the foundation for economic growth for telecommunications and IT-enabled business. However, Vietnam's reform process remains incomplete. There are concerns that the country's policies limit private sector and foreign investment. The current regulatory environment does not fully meet international norms of independence, and this affects licensing, non-discriminatory interconnection and cross-subsidies in tariffs. These issues produce uncertainty and risk for new market entrants and investors, which in turn limits network expansion, the introduction of new services and overall economic growth.

Fully liberalizing Vietnam's telecommunications sector, however, is not a short-term proposition; the process requires a long-term approach that impacts three primary government activities: developing a strategy and policy; providing the legal foundation for action, for example, through laws and regulations; and ensuring efficient implementation of a consistent and transparent regulatory environment that will ensure effective policy implementation and compliance.

3 Broadband technologies and market in Vietnam

3.1 Broadband infrastructure

In Vietnam, telecommunications operators are gradually building and completing Next Generation Network (NGN) infrastructure. This makes competition in Vietnam's telecommunications market increasingly vibrant and provides customers many new services at reasonable prices.

The backbone network has great reliability by using multiple fiber optic cables and microwave. The inter-provincial transmission network has been liberalized in all provinces and cities.

In 2008, Vietnam successfully launched the Vinasat I satellite opening a new chapter in the history of the country's telecommunications sector. Information can be transmitted to all regions of the country: mountainous area, border and sea, island and all means of traffic on the territorial waters. Information exchange with other countries is enhanced. Many new information services can be provided such as e-commerce, e-customs, e-banking, e-library, remote health, remote education, remote meeting, etc.

However, legacy systems continue to operate. Ring configuration has not been completed to ensure the redundancy of the network. Equipment comes from many different providers making it difficult to manage and develop the network.

3.1.1 Structure of broadband network in Vietnam

Vietnam has not built a unique and shared national broadband network yet. According to the MIC, eleven enterprises have been granted licenses to build network infrastructure. However, in practice, only three major companies have built telecommunications network infrastructure on a national scale (Viettel, VTN (VNPT), EVN Telecom). These networks are interconnected with each other.

In terms of physical structure, the Vietnam telecommunications network is divided into two main layers:

- The core/transmit layer: includes transmission and switching systems:

inter-regional transmission systems, transmission trunk lines connect to the region switches; international gateway switches, toll and tandem transition switch, region switch.

- The access layer: Wireline access systems include copper and optical cables access. Wireless access systems include mobile communication and fixed wireless access.

The backbone network in Vietnam is built on fiber optic technology using DWDM and SDH. The backbone system is basically divided into three levels: (i) International level, including satellite earth stations, submarine landing stations and overseas switching, (ii) National level (inter-province), including backbone route and national transit exchange, (iii) Provincial level, including inner-provincial transmission lines, host exchanges, branch exchanges and inner-provincial exchanges (tandem).

Vietnam's large coastline is an advantage for connecting to submarine fiber optic cable systems. The country's international Internet bandwidth has grown dramatically, increasing 36 times between 2005 and 2010 and stood at 194 Gbit/s in July 2011 (**Error! Reference source not found.**).

The Vietnam National Internet Exchange (VNIX) was launched in 2003. The leading ISPs are connected with 95 Gbit/s of capacity. The exchange handled 89,195,660 Giga bytes of traffic in July 2011.

The voice and data networks converge on the NGN common network. To meet market needs, all facilities-based telecommunications enterprises are changing their network to the NGN model based on the existing backbone network. This involves building a new core NGN and adapting the existing Public Switched Telephone Network (PSTN) into the NGN architecture. Operators are exploiting new services based on NGN, such as Internet TV (MegaWan of VNPT), virtual private networks, prepaid VoIP services, etc.

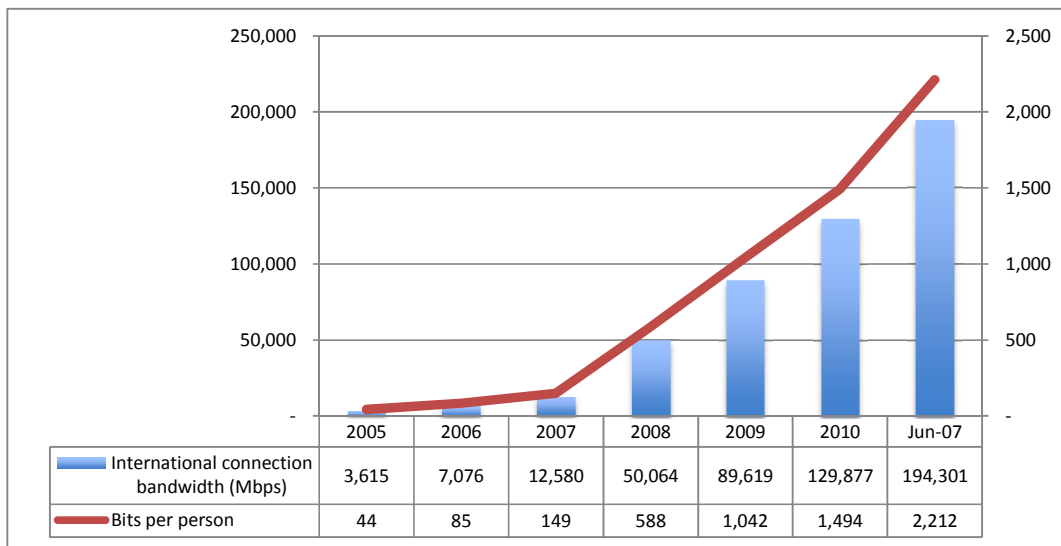


Figure 3-1: Vietnam's international Internet bandwidth (Source: VNNIC)

3.1.2 Fixed broadband technologies

When the Internet began to be offered in Vietnam, accessing it via dial-up had low speeds, high tariffs and poor quality. Broadband Internet allows users connect to the Internet easily with access technologies such as ADSL, leased line and FTTH (Fiber to the home). Dial-up is now no longer growing and tends to decrease due to low speed.

At present, most Internet users are using ADSL. Fiber to the Premise (FTTx) is a new technology deployed by service providers. Although FPT, VNPT, NetNam, Viettel and SPT have deployed FTTx broadband access technology, it is currently not a viable mass solution for broadband access due to the high price. Telecom companies provide FTTx broadband service in major cities such as Hanoi and Ho Chi Minh. However, clients are mainly institutions, businesses and apartment buildings.

To meet the business demand for broadband Internet access, Vietnam telecommunications enterprises are now deploying MetroNET access services (Metropolitan Area Network – MAN broadband service). MetroNET broadband service links industrial zones, big commercial centers, software parks, hi-tech parks, new urban areas, etc. with significant data transmission traffic.

3.1.3 Wireless broadband technologies

Mobile networks now cover the entire country (to the center of provinces/cities). Vietnam was one of the early countries to deploy GSM technology. Since 2002, CDMA technology has

also been used, and from late 2009, 3G mobile networks based on WCDMA technology are being deployed with four licensed operators: Viettel, Vinaphone, MobiFone and a partnership of EVN and HT Mobile.

Up to now, Vietnam has granted *trial* WiMAX licenses using the 802.16e standard in the 2.3 - 3.3 GHz band (compared to 800-1800 MHz for 2G and 1900-2100 MHz and 2200 MHz for 3G). WiMAX service was first implemented in Lao Cai province in 2006.⁷ Until now, WiMAX is still considered to be in “trial” even though pilots have been going on for a number of years. Although the pilot programs were intended to be a precursor to the official selection of a number of WiMAX service providers, the government ultimately decided to postpone its decision due to unfavorable market conditions; these included the high cost of the WiMAX CPE equipment, delays in the 3G licensing schedule, and the regulatory change caused by the creation of the MIC.

Accessing the Internet via satellite is also deployed although it is mainly offered for large enterprises.

3.1.3.1 4G

In April 2010, Vietnam’s Ministry of Information and Communications (MIC) announced its intention to invite proposals for a 4G plan in the country. Given that several

⁷ Lemon, Sumner. 2007. “Remote Vietnamese Village Gets Internet Access Via WiMax.” *PCWorld*, September 21. http://www.pcworld.com/article/137452/remote_vietnamese_village_gets_internet_access_via_wimax.html.

| Operator | 4G license date | Pilot launch |
|---|-----------------|---|
| Vietnam Post and Telecoms (VNPT) | Mar-06 | Trials carried out in Hanoi, Ho Chi Minh City and Lao Cai |
| Vietnam Multimedia Corporation (VTC) | Mar-06 | Trials carried out in Hanoi and Ho Chi Minh City |
| FPT Telecom | Mar-06 | To carry out trials of both wireless and wireline WiMAX |
| EVN Telecom | Jan-07 | To carry out trials of both wireless and wireline WiMAX |
| Viettel | Mar-08 | To carry out trials of wireless WiMAX |
| Saigon Postel Corporation | Mar-08 | Trials to be carried out in Ho Chi Minh City and one neighboring province |
| VNPT, Viettel, FPT Telecom, CMC and VTC | Sep-10 | To carry out trials of LTE for 12 months |

Table 3-1: 4G trials (Source: MIC 2011)

operators had already conducted trials of WiMAX services, it is thought that WiMAX would emerge as the preferred technology for developing 4G networks. The MIC sought to ensure that either WiMAX or LTE technology could be used for deploying 4G wireless broadband.

In September 2010, the MIC granted trial LTE licenses to five operators: VNPT, Viettel, FPT Telecom, CMC and Vietnam Television, Technology, Investment and Development Company (VTC). According to the terms of the license, the companies will be allowed to operate LTE networks over a trial period of 12 months. The MIC's Telecommunications Department director said that operators will be required to participate in an auction in order to be granted a 4G license.

Also in September 2010, it was announced that Vietnam Data Communication Company (VDC) and Russia's Antares had reached an agreement to build a trial LTE network. The Russian firm plans to invest US\$2 million while VDC will be responsible for obtaining the license and securing the infrastructure and equipment. Testing with 15 LTE base transceiver stations began on October 20, 2010 in Hanoi.

3.2 Status of broadband market in Vietnam

3.2.1 Fixed broadband

The fixed broadband Internet market in Vietnam is dominated by ADSL technology and has shown rapid growth. By the end of 2010, Vietnam had 3.6 million ADSL subscribers

(increasing 17 times compared to 2005, Figure 3-2, top). FTTX and cable TV broadband also exist but so far account for less than 5% of total fixed broadband subscriptions. With a fixed broadband subscription penetration of 4 per 100 people, Vietnam ranks in the middle of comparisons with other Asian nations (Figure 3-2, bottom). Its fixed broadband penetration is the highest of any middle or low-income economy in the region.

With decreasing dial-up subscribers, the broadband Internet service is dominant and favored by customers for its flexibility, convenience, and speed. The types of service are diverse and there are different packages suitable to a variety of different clients. For example VNPT, the largest ADSL provider offers five different packages ranging in speed from 1.5 to 8 Mbit/s with the lowest speed available on a prepaid basis (Figure 3-2, top). Vietnam's ADSL tariffs are the lowest in comparison to other countries analyzed for the World Bank's broadband case studies (Figure 3-2, bottom).

The quality of Internet services is increasingly improving to meet market requirements. However, there are some service providers competing on the number of subscribers rather than the quality of services. In 2010, Vietnam's fixed broadband subscriptions increased 26.7%. In 2009, the broadband market grew by 44.8% and, in the previous year, it increased by 58.3%. The slowing growth reflects the impact of competition from the 3G mobile sector, where the major operators are offering affordable mobile broadband services.

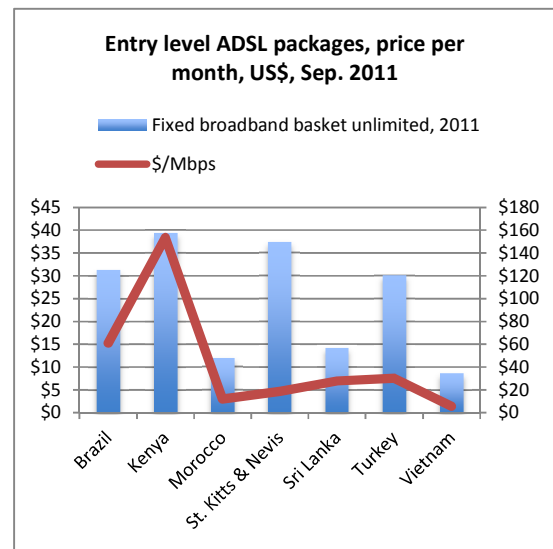
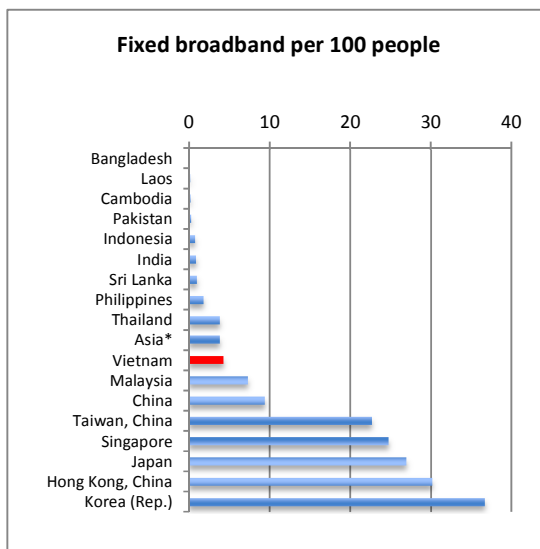
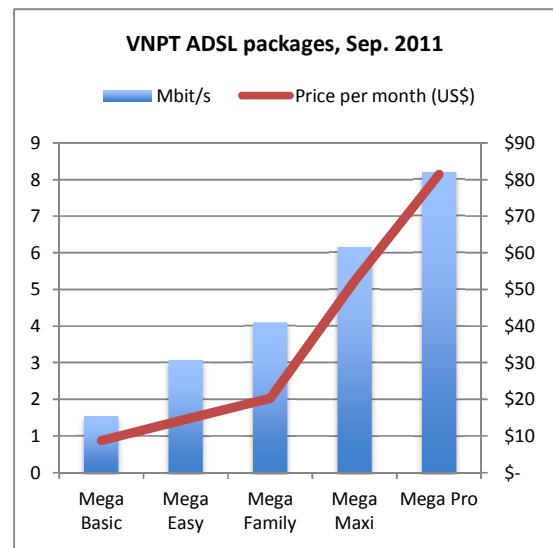
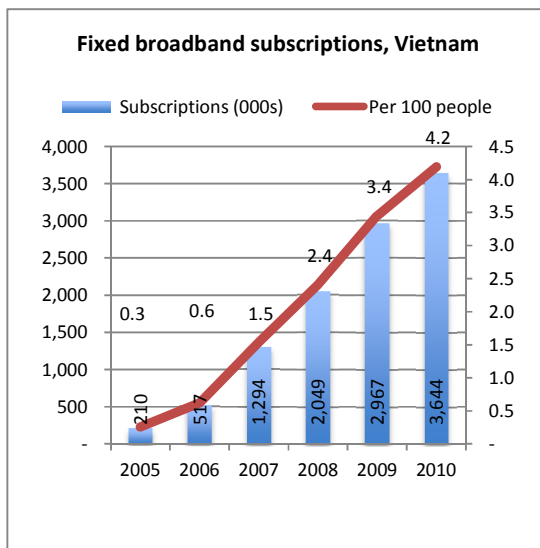


Figure 3-1: Fixed broadband subscriptions per 100 people in Vietnam and Asia, 2010
(Source: VNNIC top; ITU bottom) Note: * Median

Figure 3-2: VNPT ADSL packages and ADSL entry level prices, selected countries, USD, 2011
(Source: VNPT and leading ADSL operator in each country)

Fiber-to-the-Premises (FTTP) services were first trialed in Vietnam in December 2006. The fastest FTTP service delivers speeds of 100 Mbit/s, but the service costs VND 16 million (US\$846) per month.⁸ However, prices are expected to come down once the technology matures and competition kicks in.

3.2.2 Wireless broadband

As discussed earlier, a number of trial WiMAX licenses have been issued and pilots are being carried out throughout different locations in the country. However WiMAX has yet to be deployed on a major commercial basis.

The country's CDMA operators have introduced mobile broadband using EV-DO technology. EVN Telecom launched EV-DO in February 2006, S-Fone in October 2006 and Hanoi Telecom (Vietnamobile) in January 2007. One example of the technology's use is to provide wireless broadband for connecting schools to the Internet (Box 3-1).

⁸ "FTTH charges to decrease sharply in near future." *VietNamNet Bridge*, April 21, 2011. <http://english.vietnamnet.vn/en/print/latest-news/7387/ftth-charges-to-decrease-sharply-in-near-future.html>.

The objective of “Training Online Programs and Incubation for Communities - 64 Provinces” is to provide IT skills training and improved communications to underserved portions of the country by equipping 64 community technology and learning centers (CLTC) throughout Vietnam with computers, software, Vietnamese textbooks and, wireless CDMA2000 1x and 1xEV-DO service for Internet access (in 450 MHz).

The partners are Hanoi Polytechnic University’s Center for Research and Consulting on Management; EVN Telecom; Microsoft Corporation and the United States Agency for International Development.

Source: “Qualcomm’s Wireless Reach Initiative Brings Advanced 3G Technology to Vietnam Communities”, *Press Release*, March 24, 2008.

Box 3-1: TOPIC64

In August 2009, the four winners of Vietnam’s third generation (3G) WCDMA mobile concessions were issued licenses. The recipients were military-owned Viettel, VNPT subsidiaries Mobifone and Vinaphone, and a joint venture between EVN Telecom and Hanoi Telecom. Although applications were received from six operators, a lack of available spectrum in the 1900-2200 MHz frequency band was the deciding factor behind 3G licenses being limited to four. The operators have to accomplish coverage and investment targets (**Error! Reference source not found.**).

The other license applicants were GTel (a Russian-Vietnamese Joint Venture) and Saigon Postel, which is a major shareholder in Vietnam’s fourth largest mobile operator, S-Fone. Although GTel and S-Fone were not granted a concession, they were permitted to partner with one of the four winners to provide 3G services in the country. GTel is understood to be partnering with rival Vinaphone to build a 3G network and provide the relevant services. Two other companies are reportedly planning to provide 3G services over the network of one of





| | |  |  |  |  |
|----------------------------|-----------------------|---|---|---|--|
| | | Viettel | Vinaphone | Mobifone | EVN Telecom & Vietnamobile |
| Investment | First 3 years | US\$ 800M | US\$ 600M | US\$ 350M | US\$ 370M |
| | Security money | US\$ 280M | US\$ 93M | US\$ 93M | US\$ 37M |
| Network deployment | | <ul style="list-style-type: none"> • 9 m: 87% population (5000 Nodes B) • 1 yr: 9000 Nodes B • 3 yr: 100% population | <ul style="list-style-type: none"> • Q3'09: 20% population • 3 yr: 50% population • 6 yr: 75% population | <ul style="list-style-type: none"> • 3 m: 2000 Nodes B • 1 yr: 100% big suburbs • 3 yr: 98% population | <ul style="list-style-type: none"> • 9 m: 50% population (2500 Nodes B) • 3 yr: 5000 Nodes B |
| Deployed technology | | HSPA | WCDMA | HSPA | HSPA |
| Service launch | | 9 months after license allocation (i.e. April 2010) | Q3 '09 | 3 months after license allocation (i.e. Oct. 2009) | Q1 '10 |

Table 3-3: 3G (WCDMA) obligations of mobile operators

the market's established telecommunications operators: they are state-run Vietnam Multimedia Corporation (VTC) and local company Dong Duong.

The first 3G WCDMA-based network was commercially launched in October 2009 by Vinaphone followed by Mobifone in December. To encourage subscribers to upgrade from 2G to 3G, Mobifone launched a three-month special promotion, which allowed customers to make video calls at the same tariffs applied to normal calls, and offering a 50% discount for mobile Internet and mobile TV. By September 2010, all of the licensees had launched their networks and there were some 8.5 million 3G subscriptions, exceeding fixed broadband within one year of launch.⁹ Three operators have launched HSDPA with download speeds up to 14.4 Mbit/s.

The tariff for 3G services is freely set and does not differ much between operators. Mobifone offers packages depending on the speed (3.6 Mbit/s or 7.2 Mbit/s). Within those two speeds, daily, weekly or monthly options are available with each having a different amount of data included (**Error! Reference source not found.**, top). The price of a monthly 3G package (including 1 GB of data) is the second lowest in Vietnam in comparison to other countries analyzed for the World Bank's broadband case studies (**Error! Reference source not found.**, bottom).

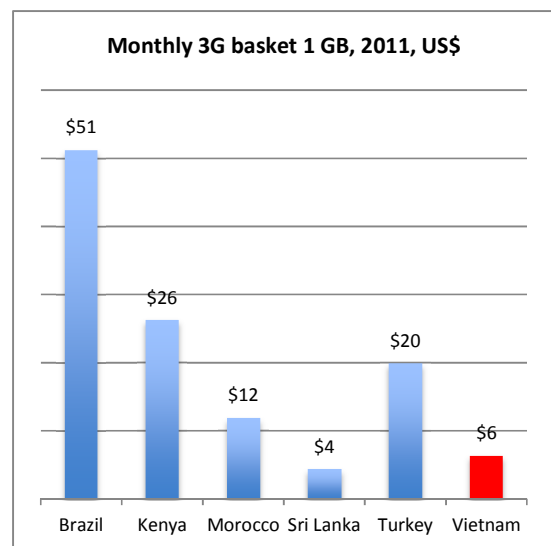
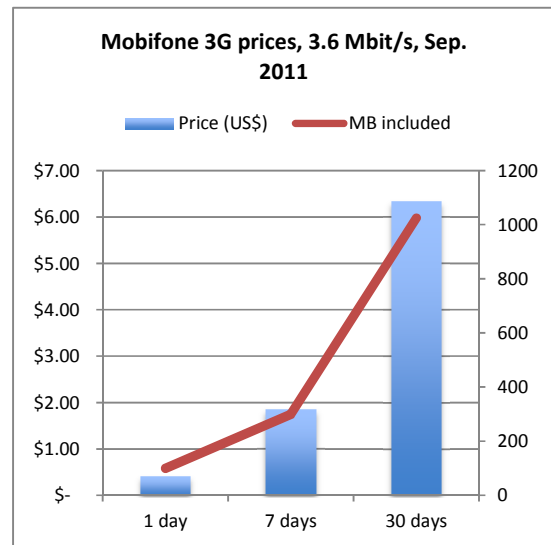


Figure 3-4: Mobifone 3G prices and monthly 3G prices, selected countries, USD, 2011 (Source: Mobifone and leading 3G operator in each country) Note: The top chart refers to pricing for 3.6 Mbit/s.

⁹ Wireless Intelligence. "Vietnam makes solid start in 3G", November 2010. <https://www.wirelessintelligence.com/analysis/2010/11/vietnam-makes-solid-start-in-3g/>

4 4. Rural broadband strategies

The gap between rural and urban areas in access to the Internet, especially broadband Internet service is quite large. Broadband in Vietnam is considered saturated but in reality, saturation occurs only in the cities and major centers. Vietnam has about 89 million people including 72% living in rural areas and the market of potential customers has not been fully exploited. This is a huge gap in the development of telecommunication services including broadband Internet. Vietnam has adopted various policies in an effort to minimize the broadband divide between urban and rural areas.

From now until 2015 and further to 2020, Vietnam will give priority to the development of broadband in rural areas, especially to bring broadband to rural districts and poor communes. In addition to the general policy priorities for rural broadband development, the government also has special offers to help people in poor regions have access to technology and help develop production and improve quality of life. Broadband can contribute to poverty reduction, maintain social order and national security, raise education levels and create conditions for accelerating the modernization of agriculture and rural areas. Besides priority policies of broadband development for poor rural regions, the government is encouraging investment in broadband for schools and public hospitals in rural areas aimed at uniformly developing and narrowing the digital gap between regions.

4.1 Delta and midland rural areas

Due to relative geographical and socio-economic advantages, such as proximity to cities, economic centers and industrial parks, Internet in the delta and midland area has developed rapidly. The broadband network basically connects to the district level, towns and some communes. Specific results as follows:

- Most communes have an access point providing telecommunications and Internet services for the community.
- The broadband transmission network has come to more than 84% of communes nationwide, in which:
 - Number of communes using fiber optic transmission accounts for over 56%.
 - Number of communes using microwave transmission accounts more than 25%.
 - Number of communes using satellite transmission (VSAT DAMA, VSAT IP) accounts 3%.

The development of broadband services in the delta and midland areas compared to municipalities is shown in the statistical table below.

| | Broadband Internet penetration (subscribers per 100 inhabitants) | |
|---|---|-------|
| | 2006 | 2008 |
| SONG HONG (RED RIVER) DELTA REGION | | |
| Hanoi | 8.63 | 10.92 |
| The rural of Song Hong delta | 0.47 | 1.40 |
| THE CENTRAL REGION | | |
| Da Nang city | 4.07 | 6.79 |
| South-central Coast | 0.79 | 1.362 |
| THE SOUTHEAST REGION | | |
| Ho Chi Minh city | 6.47 | 8.53 |
| The Southeast area | 1.15 | 2.17 |
| MEKONG RIVER DELTA REGION | | |
| Can Tho city | 1.38 | 2.15 |
| Cuu Long river delta area | 0.49 | 0.932 |

Table 4-1: Telecommunications services development in delta and midland areas

The rural telecommunications market promises great potential and there should be significant competition because broadband has developed close to saturation levels in urban areas while rural markets are in the initial development period. On the other hand, rural areas are now developing towards urbanization and there are many new industrial zones recently built.

Although it achieved some initial results, rural Internet network infrastructure and quality of service still significantly lags urban areas—Hanoi and Ho Chi Minh City account for 65% of total broadband subscribers—and faces several challenges:

- Network capacity is still weak and there is not a common master plan for network and technology. Except for the mobile sector, most telecommunications services and particularly broadband Internet in rural areas are being developed based on extended city and town networks.
- Low income and awareness inhibits broadband affordability and capability.

4.2 Extreme poverty rural communes

Communes in remote, border and island areas and the 62 poorest districts and communes under “Program 135” are referred to as “extreme poverty communes”. The extreme poverty communes have common characteristics:

- Tough geographical conditions and harsh weather;
- Difficult transportation;
- Underdeveloped infrastructure and economic and social conditions;
- Construction and maintenance of telecommunications infrastructure is costly and slow capital recovery and low profitability discourages enterprises from investing in these areas.

To develop infrastructure and universalize telecommunications and Internet services for extreme poverty communes, the State has been supporting supply and use of services for inhabitants and enterprises through two special programs: developing communal access points and providing universal telecommunication services.

4.2.1 Communal P&T and Cultural Points

VNPT had a program to develop so-called Communal P&T and Cultural Points (CPCP)¹⁰ during the period 1998 – 2007. The objectives of the program were to provide telecommunications service at the commune level; to narrow the digital divide between rural and urban areas, and to promote socio-economic development.

Up to 2007, VNPT built and put into use some 8,000 CPCPs serving 76% of the rural population, in which 1,535 were located in extreme poverty communes (out a total of 1,644 extreme poverty communes). In addition to postal and culture services such as books and magazines, the CPCPs have played an important role in providing telephone, Internet and information technology services for rural and especially for extreme poverty areas. The CPCPs also played an important part in completing the task of bringing telephones to 100% of communes nationwide in 2005. In 2003, VNPT started supplying mainly dial-up Internet access to around 3,000 CPCPs at a cost of 35 billion VND (US\$2.3 million).¹¹

After 10 years of operating, besides the notable achievements, the CPCPs also faced obstacles that limited effectiveness:

- Cost of operating, repairing and upgrading has risen due to age of the system.
- Turnover in some points is too low and does not cover operating costs. Broadband Internet has not been set up in a large number of CPCPs so quality of services is low, content is poor and hence it is more difficult to attract people.
- Some CPCPs are built in places that are located far from residential areas and inconvenient for people, whereas some others are built near urban areas or developed socio-economic region where there is less demand due to other options.
- Remuneration for the manager of the CPCP is often low. The general

¹⁰ The English term used by VNPT but also referred to as Cultural Post Offices, Communal Post Culture Points and Village Post and Cultural Points.

¹¹ The Asia Foundation. 2009. *Training Needs Assessment Report: Public Library Institutions and Communal Cultural Post Offices*. <http://asiafoundation.org/publications/pdf/563>.

educational qualification and expertise of the majority of managers is limited and they sometimes do not receive adequate training.

4.2.2 Universal telecommunication services program

Universal service and access goals are outlined in Decision No 74/2006/QĐ-TTg of the Prime Minister and called “Program 74”.¹² The public utility telecommunications area is announced annually by the Ministry of Information and Communication, including most communes of the 62 poorest districts, communes under Program 135, and communes in remote and island areas where teledensity is below 2.5 subscribers per 100 inhabitants.

The Program’s overall objective up to 2010 was to implement universalization of basic telecommunications services for extreme poverty rural residents including providing 70% of communes with a public Internet access point.

The Vietnam Public Utility Telecommunication Service Fund supports the implementation of State’s policies on provision of public utility telecommunication service throughout the whole country. Mechanisms include:

- Supporting development of telecommunications network infrastructure and public telecommunication services access points in the form of grant assistance and preferential loans.
- Supporting people to use telecommunications services in the form of reduced service charges and VAT exemption.

After more than four years of implementation, Program 74 has mobilized financial resources and technical capacity of telecommunications enterprises in Vietnam to develop network infrastructure and services for extreme poverty rural areas. Through Program 74, the State has made a balance between rights and obligations among telecommunications enterprises in universalization of public utility telecommunications services. While the Program of developing the CPCPs was taken care of only by the VNPT Group, Program 74 has the

participation of major telecommunications companies such as the VNPT Group, Viettel, EVN Telecom and the Vietnam Maritime Communication and Electronics Company (VISHIPEL). VNPT, Viettel and EVN Telecom are ordered by the State to provide phone and Internet services and VISHIPEL is ordered to provide public utility telecommunications services for fishermen at sea.

Thus Program 74 not only provides an opportunity to access and use telecommunications services for more than 20 million people in rural areas for economic and social development, but this Program also supports and encourages enterprises to aggressively invest in infrastructure networks and service development in order to provision the rural market. Some specific results of Program 74 up to June 2010 are:

- Most people of 4,240 communes in the 62 poorest districts and communes under Program 135, in the remote, border and islands areas with about 22 million people (accounting for 26% of the national population) have received benefits from the public utility telecommunications support policy of the State.
- Support to develop more than 75,623 new Internet subscribers.
- Support to maintain the network for 275,307 Internet subscribers.
- Support for 4,054 public Internet access points.
- Internet subscription density in public utility regions rose from 0.018 (late 2004) to 0.32 subscribers per 100 inhabitants (late 2009).

The program has faced some difficulties and limitations:

- The development of infrastructure has not kept up with demand. There are many differences in infrastructure and subscriber density between extreme poverty rural and urban areas. At the end of 2009, Internet subscriber density in the public utility telecommunications region was only 0.3 subscribers per 100 inhabitants (although it is nearly 18 times higher than in 2004). Meanwhile Hanoi has 13.9 subscribers per 100 inhabitants, Da Nang has 8.8 subscribers per 100 inhabitants and Ho

¹² “Approving Program on provision of public-utility telecommunications service until 2010.” Available at: <http://english.mic.gov.vn/vbqpl/Lists/Vn%20bn%20QP/PL/DispForm.aspx?ID=6248>

Chi Minh has 10.5 subscribers per 100 inhabitants.

- The development of infrastructure and types of services among public utility regions is unbalanced. Communes in Region 1 and Region 2 with favourable conditions have overheated development that exceeds plan targets, while communes in Region 3 far from the district centers have levels that do not meet targets. The development of Internet subscribers and public Internet access points have not met targets.
- Support in the form of preferential loans to build public telecommunication services access points is not realistic because these areas have difficult geographical and socio-economic conditions, low investment efficiency and are unlikely to recover capital so they do not encourage enterprises' investment. Up to now there are 3,130 communes without public Internet access points, and Internet subscriber density is very low and does not meet the target.
- Regarding developing new individual and household Internet subscribers, and new public Internet access points, only VNPT has exceeded the plan while other enterprises focused investment in urban areas.

4.3 Future plans

Decision No. 119/QĐ-TTg on 18/01/2011 by the Prime Minister approving the project for rural communications during the period 2011 – 2020 identifies a number of goals relating to Internet and broadband access and services:

- 100% of communes are connected by broadband transmission lines.
- 100% of communes having People's Committee offices, schools and health centers are providing Internet broadband services.
- Internet subscriber density in rural areas reaches 30% to 40% national average density.
- The state agency from the district level, departments, sectors or equivalent or higher should have e-portals or websites providing all public online services to residents and enterprises in rural areas.
- The offices of the Party and government authority from the central to commune level to have their e-mail address for receiving and publicly responding to feedback of the people.
- The electronic information websites of the Party, State, political and social organizations in central and local levels have programs to receive and reply to comments of the people.

5 Analysis of broadband success and challenges in Vietnam

Given its status as a lower-middle-income economy, Vietnam has made impressive strides in broadband development. It has the highest fixed broadband penetration among low and lower-middle income countries in Asia. Though IMT-2000 WCDMA 3G networks were only introduced in 2009, the number of mobile broadband subscriptions already exceeds fixed broadband. Rapid economic growth and relatively high literacy levels have contributed to this achievement. Incomes have risen so more people can afford broadband services while many people, at least in urban areas, have the skills and awareness to access and use content and applications delivered over high speed networks.

In terms of policy and regulatory tools for developing broadband, Vietnam has forged its own path. This has often run contrary to typical recommendations for achieving ICT growth. There is no separate sector regulatory entity, the largest operators are government owned and direct foreign investment in the telecommunications market has been limited for political reasons.¹³ Nevertheless the country has developed a high level of competition among mainly state-owned enterprises.

5.1 Social-economic characteristics

When the Internet started to appear in Vietnam in 1997, prices were high and speeds slow, and only a few people had the need and conditions to access the Internet. However, the opening of the economy and enhanced integration with other countries in the region and the world, and the abolishment of monopoly in telecommunications, has significantly improved the ICT market sector.

Parallel to this, the demand for Internet and especially broadband increased and this opportunity was well exploited by the service operators. In addition to improving service quality, the price for Internet access and value

added services also improved. With access charges declining, service quality improving, variety in the number of services offered increasing and incomes rising, favorable conditions have been created for sustained broadband growth in Vietnam over the coming years.

On the other hand, telecommunications providers are developing new services but most of these services are only suitable for high-speed fiber optic transmission. The cost of installation and use of these services is high and only suitable in new urban areas and large enterprises. Fiber to the Home (FTTH) is quite expensive, so ADSL is the first choice of the household even though it is difficult to upgrade the transmission capacity.

5.2 Technological capability

Vietnamese telecommunications service providers now have a system of modern telecommunications equipment with thousands of broadband Internet connection ports. Each service provider has developed the network infrastructure with modern IP-based networks. The transmission system is built with extensive fiber optic and digital microwave transmission technology to support multimedia data services. The new broadband services exploiting NGNs meets the needs of advanced users for voice, video and data. However, with diverse forms of services provided, price pressure is a challenge for service providers today.

Continuous investment in new technologies to improve and update technology to keep pace with world trends is a requirement of the market as well as goals for telecommunications businesses. Pressure on traditional service prices have led to disparities in investment in telecommunications infrastructure. Telecom enterprises are focusing on developing mobile networks without development of the wired network; meanwhile the wired network is critical to build long-term telecommunications infrastructure.

On the other hand, due to competition in Vietnam's telecommunications market (there are around a dozen enterprises providing telecommunications infrastructure), providers have a common need in sharing, but sharing telecommunications infrastructure is difficult, leading to overlap in investment in the access network. This causes problems of wasted

¹³ There has not been a significant change since 2002 with one report remarking: "...the unwillingness of the Vietnamese governments to convert the BCCs into joint venture agreements by permitting a degree of foreign ownership." See: Minges, Michael, and Tim Kelly. 2002. *Vietnam Internet Case Study*. Geneva: International Telecommunication Union. <http://www.itu.int/ITU-D/ict/cs/vietnam/index.html>.

resources, difficulties for users, visual pollution, etc. There are too many businesses providing infrastructure development making it difficult for interconnection because every operator applies different technology. This does not lead to harmonization in national telecommunications infrastructure and is not sustainable to meet the development needs of the country in the future. The service providers are now trying to develop a shared co-operation network infrastructure but so far no specific measures have been implemented due to disagreement on the benefits as well as a lack appropriate regulatory guidelines.

Internet today is associated with modern life. Young people in urban areas, especially Hanoi and Ho Chi Minh "live" with Internet because of their favorable condition and because network access is better than in the provinces. They can find everything they need with the Internet and actively choose their favorite entertainment. An emerging issue is the management of harmful information in conflict with Vietnamese traditions. High-speeds, rich content and reasonable prices are urgent needs for Internet users in general and students in particular. Especially in the present moment, when the Internet is being deployed in schools and expanded to rural, mountainous areas, the policy for development of the Internet in general and broadband in particular should ensure rational development of infrastructure and services as well as the ensuring quality.

The lack of relevant content, as well as fragmented information, calls for a public information network through a unified portal, equipped with an automatic translation engine, with rich multimedia content such as health, education, culture, agriculture, libraries, etc.

5.3 Conclusion and lessons learned

The following points summarize Vietnam's broadband development:

- There is a need for direction and consistency of the Government for broadband development; investment in broadband in particular and ICT

in general should be considered as investment in social economic infrastructure, laying the foundation for development in other sectors.

- There is a need to develop strategies, planning, programs and innovative projects and it is important to mobilize all possible resources to promote the development of broadband.
- Government policy is needed to encourage broadband investment by operators (infrastructure incentives, tax exemptions, etc.) and to stimulate users to use the service (free or reduced cost, subsidized terminal equipment, training, etc.).
- Competition among service providers should be encouraged, creating incentives for development, while allowing businesses to set prices and introduce services.
- There is a need to focus broadband development evenly between regions especially rural areas because this is the most concentrated area of the population, having long-term growth potential.
- Challenges arising from the broadband development process also need to be considered:
 - Development of the width (the number of subscribers) should be coupled with development of depth (service quality) for sustainable, long-term development.
 - The difference in the level of broadband between regions is contributing to widening gaps.
 - The rapid development of broadband can create problems, affecting social life, security and politics.

About *infoDev*

infoDev is a global development financing program among international development agencies, coordinated and served by an expert Secretariat housed at the World Bank Group, one of its key donors and founders. It acts as a neutral convener of dialogue—and as a coordinator of joint action among bilateral and multilateral donors—supporting global sharing of information on ICT for development (ICT4D), and helping to reduce duplication of efforts and investments. *infoDev* also forms partnerships with public and private sector organizations who are innovators in the field of ICT4D. *infoDev* is housed in the Financial and Private Sector Development (FPD) Vice Presidency of the World Bank Group.

For additional information about this study or more general information on *infoDev*, please visit www.infoddev.org/publications.