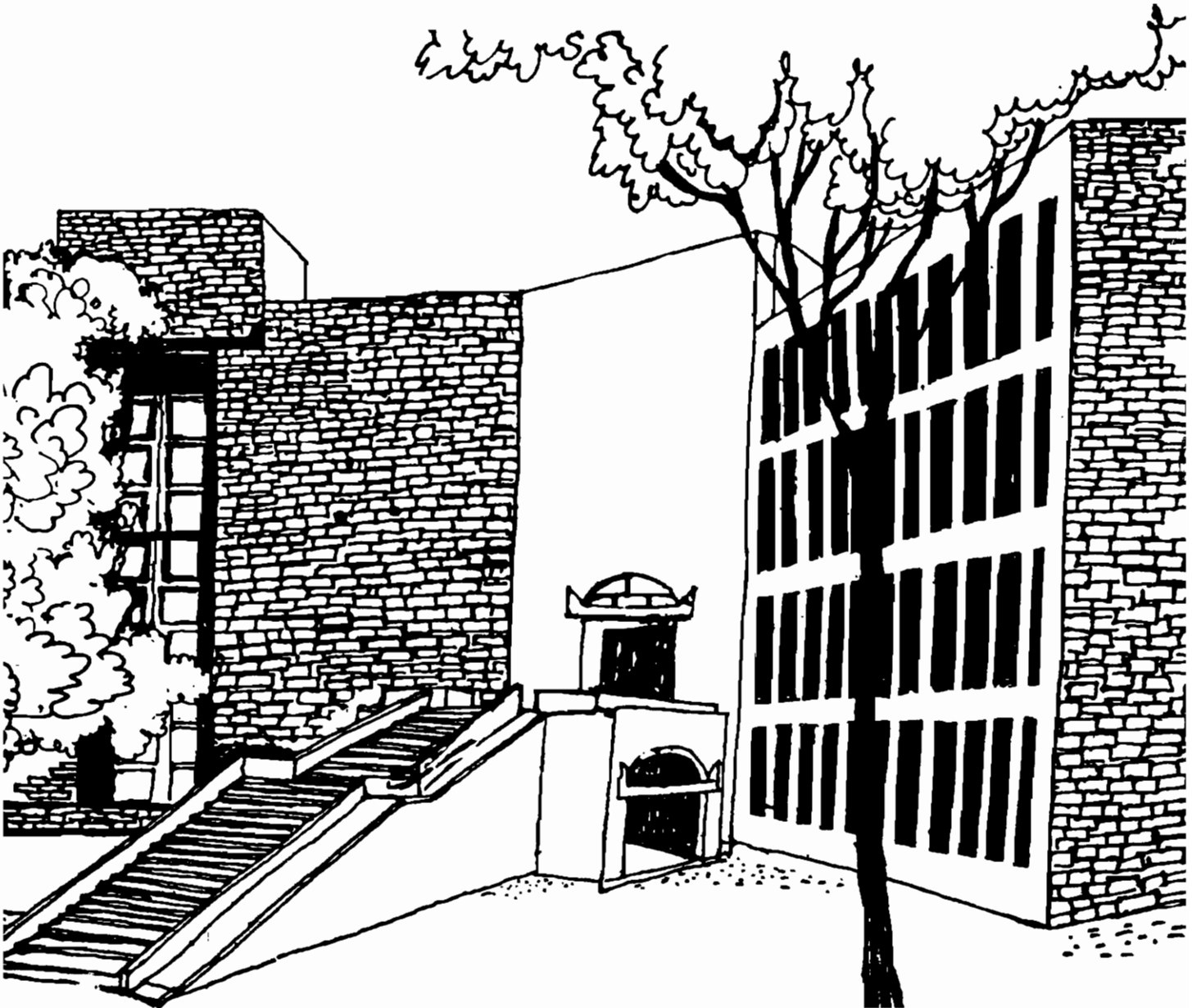




# Working Paper




**PHILIPPINES TELECOMMUNICATIONS SECTOR:  
AN ASSESSMENT OF POLICY CHANGES**

By

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## **Philippines Telecommunications Sector : An Assessment of Policy Changes**

Philippine economy which had been showing modest growth rates varying between 3.8 percent to 6 percent since 1987, slowed down from 1988 due to a series of natural calamities and political turbulence. It picked up in 1992 after the installation of a new government. The GNP growth rates since 1991 have been 1.10, 2.60 and 3.70 percent respectively. The Philippines government has undertaken a major reform program to accelerate the growth in economy and set for itself the goal of being a developed nation by 2000 AD. It views the private sector as a major source of investment for infrastructure building. It has also enacted a law whereby private investors are allowed to construct infrastructure and then maintain and operate it for a fixed period of time. Tariff rates on import of raw material and capital equipment have been reduced. In addition, government is aggressively seeking developmental funds from international agencies for infrastructure development. The low level of investment in infrastructure during the period of slow economic growth is also reflected in low telecom service levels. In Philippines even though the private sector was the dominant provider of telecom services, the service levels continued to be poor largely because of the monopoly of a single provider.

The government mounted a concerted effort in 1982 to plan telecom development during 1982-87. A significant feature of this plan was the involvement of the government in provision of telecom services, primarily through the National Telephone Program, which envisioned the installation of more than 2 million lines. Subsequently a number of plans and important circulars have been issued which have influenced the growth of this sector.

This paper attempts to review the status of the Philippine telecom sector and the policy changes and draw implications for the management of telecom reforms. In view of telecom sector reforms in other developing countries, the Philippine experience brings forth issues which have relevance to other developing countries undertaking similar reform programs.

### **Telecom Sector**

Philippines telecom sector shares typical characteristics with telecom sectors in other developing countries. It has a low density of telephones (1.4 per hundred). The spread is skewed in favor of urban population and there are long waiting lists. For example, while Manila accounts for around 12% of the population, it has 75% of the country's phones and a density of nearly 8 per hundred.

#### **Structure**

There are a number of government agencies, public and private operators, network operators, equipment manufacturers and suppliers and local industry associations which influence the provision of telecom services.

The Department of Transportation and Communication (DOTC) is the policy making unit of the government. The National Telecommunications Commission (NTC), a government agency is the regulatory body with quasi-judicial powers. The Telecommunications office (TELOF) is the operating arm providing some telephone and telegraph services and the Municipal Telephone Projects office is the implementing arm of the government's municipal telephone program.

The National Economic and Development Authority formulates the country's overall economic policies and developmental strategies. The DOTC's plans and strategies are formulated within the general framework of National Economic and Development Authority. Department of Trade and Industry and the Board of Investment formulate policies regarding investments in the country. While the NTC is responsible for granting specific authorities, the Congress and local governments alone can enfranchise private carriers.

There are nearly 62 private operators, the largest among them being the Philippines Long Distance Telephone Company (PLDT). It owns the most extensive network and accounts for more than 94% of the country's installations. The rest of the telephone facilities are owned by TELOF and other small private companies and municipal telephone companies. PLDT offers a host of telecom services including cellular mobile, fax, video services etc, besides owning four of the six international gateways.

### **Equipment Manufacture**

There is an indigenous industry as well as multinationals involvement in this segment. The local industry is largely involved in manufacture of terminal and datacom equipment and cables.

### **Network**

Local carriers include PLDT, local government, TELOF, and small private carriers. PLDT owns nearly 94% of the main stations and around 47% of the local exchanges. While the government owns 0.7% and nearly 20% of the main and local exchanges respectively, the private carriers own the remaining 5.5% and 32.4% of the main and local exchanges. Exhibit 1 provides the number of exchanges and main stations operated by the various agencies. Exhibit 2 provides data on the switching technology.

The Municipal Telephone Act established a Municipal Telephone Projects Office to implement a nationwide plan to install a phone in every unserved municipality. Qualified private operators were given a first option to provide, install and operate the public call offices in these areas. As of February 1993, 206 phones had been installed by the government and 145 by private operators.

Telephone availability is around 2 per hundred for cities other than Manila and 0.1 for the rest of the country. Before the implementation of the Municipal Telephone Projects in 1990, only 20% of the municipalities had access to telephone services. By 1992, this had increased to 44%. Most of the local exchanges are connected to public switched telephone network, though the number of interconnections are insufficient.

### *Long Distance Network*

While PLDT owns and operates an extensive transmission network, the government is developing an alternate transmission backbone through its Regional Telecommunication Development project and the National Telephone Program.

Other carriers like Philippine Telegraph and Telephone Corporation, Radio Communication of Philippines, and Digital Communication of Philippines operate long distance public phone booths and compete with enfranchised local operators.

PLDT, Eastern Telecommunications Philippines, Inc (ETPI) and Philippine Global Communication (PhilCom) operate international switching centers. ETPI and PhilCom hold and maintain correspondence agreements with a number of countries and operate their own facilities.

### **Cellular Mobile and Other Radio Services**

Two private companies, Phintel and Extelcom provide nationwide cellular mobile services. In 1992, this segment was opened for greater competition. As a result seven other operators applied for permission to operate cellular mobile services. It is now estimated that if current growth rates are maintained and if frequency availability does not become a constraint, mobile phones are likely to outnumber fixed-line telephones by 1995 [Asia-Pacific Telecommunication Indicators, 1993]. This

growth may be due to the poor fixed-link infrastructure in Philippines, and non-availability of other mobile communication systems such as radio pagers.

Radio paging services market has also opened up with five players offering this service. For fax and telex services there is regulated competition but as there few interconnections among the operators, subscribers are forced to subscribe to two or more operators for wider coverage.

### **Satellite Services**

Until 1989, satellite services had been provided by Philippines Communications Satellite (Philcomsat) for the international segment and by Domestic Satellite Philippine Corporation (Domsat) for the domestic segment. Domsat had heavy financial burden and was unable to support any further increase in traffic. Subsequently, other operators were allowed to set up VSAT networks and provide wholesale and retail marketing of channels. Operators who leased channels could provide value added services. In 1991, Capitol Wireless Inc. signed a joint venture with the DOTC to own and operate 56 earth stations which would be tied up with 30 other stations owned by Capwire. This network would provide value added services and augment the existing expansion plans for public phones in the municipalities and rural areas.

### **Financial Performance**

The profits in telecom sector recorded 25% growth during the period 1982-1991, largely due to PLDT's and larger international service providers performance. The smaller companies posted declining performances and losses. Low tariff rates and inadequate long distance revenues have been cited as reasons for this.

Companies are mandated to charge tariffs based on a rate of return not more than 12% on their net costs. Since many companies have foreign exchange obligation (due to import of equipment) there is a mechanism to allow them to change the tariffs within 1% of the approved base rate whenever there is P 0.10 increase/decrease in peso/dollar conversion rate. This mechanism is planned to be reviewed to ensure that providers do not overcharge subscribers.

## **Changes in Policy**

In 1988, the government set up a joint industry-government ad-hoc committee called the National Development Committee (NTDP). This committee consisted of top - level decision makers, industrialists and was chaired by Chairman, DOTC. It was tasked with drawing up a plan for rationalization of the telecom sector. It initiated a number of legislative changes though some of these had not been approved even by 1992 year end. This legislation sought to define the relationship between the policy and regulatory arms of the government and pave the way for reorganization of NTC. It was able to seek legislation which authorized installation of telephones in around 1000 municipalities.

Subsequently, this committee was wound up, keeping in mind the ad-hoc nature of its origin. Later, a Telecom Policy and Programs Review Committee was formed consisting of high level officials from DOTC, NTC, and TELOF. This committee provides a high level review of DOTC policy and planning to ensure that government's objectives are being met. It also facilitates coordination between various agencies to ensure smooth implementation. It has been instrumental in formulating a government policy on cellular mobile and domestic satellites, implementation of guidelines for cellular mobile services and mandating interconnections of all public telecommunication systems and provision of universal access. The committee also mandated international gateway operators and providers of services which are possible sources of subsidy to provide local exchange services in the unserved areas.

In 1993, DOTC prepared a National Telecommunication Development Plan (NTDP) which specified sector policies and goals, identified constraints, and suggested mechanisms for overcoming some of these problems. Exhibits 3 and 4 give information on physical targets and investment requirements to meet telephone main station density targets respectively. In preparing the NTDP, views of various organizations and agencies such as Philippine Association of Private Telephone Companies, Philippines Electronics and Telecommunications Engineers Federation and the Telecom Users Group, representatives of National Economic and Development Authority, Board of Investment and service providers were incorporated. The NTDP was to be reviewed annually for refinements and amendments with a major review every five years. The DOTC has major responsibility for monitoring implementation of NTDP. DOTC is required to provide staff for monitoring the progress of implementation.

The NTDP detailed out the following significant policy changes.

#### **Role of Private Sector**

The private sector has been chosen as the major mechanism for providing telecom services and would be responsible for adhering to quality of standards service specified by NTC. The government's policy is to trust operation of all public telecommunication to private carriers with TELOF being the interim operator until privatization is complete.

#### **Role of the Government**

The government's role would be of policy formulation, regulation and facilitating national goal achievements. The government plans to strengthen the NTC to enable it to monitor entire spectrum of telecom services. NTC has been authorized to impose sanctions on those operators who do not meet quality of standards or efficiency. The sanctions are to be designed so that they do not affect the subscribers. The government plans to facilitate development by channelizing Official Development Assistance to the operators. Even when the government would own telecom facilities, it would attempt to find a private sector operator.

#### **Universal Access and Network Interconnection**

The government articulated its objective of providing universal access. To maximize the use of existing telecom facilities, it decided to make it mandatory for all operators to provide interconnections to other operators. The interconnection would be on a payment basis to be mutually worked out between the two parties. NTC would be the arbitrator in case of disputes for compensation.

#### **Intra-sectoral Cross Subsidies**

The government's policy regarding interconnection is to cross - subsidize local exchange service until universal access is available and the service reflects actual costs. Cellular mobile services, value added services would compensate the local exchange carrier for providing the network.

#### **Investment Efficiency**

The government would encourage only limited competition, especially in areas with inadequate demand, to prevent unnecessary duplication of services. In case there are several small carriers in unprofitable areas, the government will encourage their merger.

#### **Liberalization of Services**

The government already allows competition in non-basic services such as cellular mobile, radio paging etc, though tariffs are determined by NTC. In the future the telecom services are planned to be further

liberalized, with NTC's role being that of a pure arbitrator. It is also planned to liberalize datacom services, and other value added services.

### **Indigenous Production**

The government supports indigenous manufacture as far as possible.

### **Technology Standards**

Based on design considerations and likely technological scenario, the government identified a set of candidate technologies for the various segments such as cellular mobile, rural exchanges, small earth stations etc. The details are provided in Exhibit 5.

Digitalization of inter-exchange network is targeted by 1997 and that of local exchanges by 2000. Telephone carriers are required to provide full subscriber dialling of domestic and international calls. It is planned that by 2000, 80% of the lines should be direct dial capable and by 2010, all lines to be direct dial capable.

## **Consequences of Policy Changes**

### **Private Sector's Role in Provision of Services**

Even though the government policy supports private investment, the system of franchising is costly and involves delays. There are no effective mechanisms to ensure that duplication of services does not take place in the areas with less demand. In many areas, the private sector had only been involved in provision of services to the most profitable areas, bypassing areas with marginal demand.

### **Introduction of Competition and Spread of Services**

The government is grappling with the dual issue of introduction of competition and universal access. Whereas private sector is interested in provision of services in urban, profitable areas, it is unwilling to support services in rural areas. Therefore the NTC issued franchises for provision of basic services based on a "package" of services. Each of the profitable areas was bundled with a provincial area for bidding for provision of services. The bundling of areas was done on the basis of estimated revenue generation from the two areas. NTC attempted to equalize the revenue generating potential across the areas.

In order to spread the telecom services, NTC has mandated that for every one international gateway line, the operator would have to provide 300 local exchange lines. Likewise the cellular mobile operator is required to provide 4 local exchange lines for every single line of cellular mobile. In addition, each operator is required to provide a specified minimum local exchange lines within a fixed time period of three and five years respectively.

### **Interconnection Issues**

The government mandated the interconnection among all interexchange carriers and international carriers by a pre-specified date. The carriers are required to proactively negotiate interconnection agreements. The agreements are to be submitted to NTC for approval within 10 days of executing the agreement. The NTC approval would be available within 30 days. If parties fail to come to an agreement, NTC could resolve the issue on the basis of application of any of the parties. NTC also issued detailed guidelines regarding technical and operational requirement of each of the interconnecting parties (Appendix 1). It also provided a basis for charges and settlement and framework for addressing the related issues. For example, the mandate specifies that each



interconnecting party shall submit to each other a monthly reconciliation report within 90 days of the following month. The party with balance after reconciliation shall pay the balance within 30 days. Amounts due which are not paid within this period shall bear interest at an agreed rate. NTC also detailed out the basis for access charges (Appendix 1).

### **Monitoring Systems**

After the operator starts providing services, NTC has chalked out detailed guidelines for monitoring performance. For example, each franchise holder is expected to execute a performance bond which will be forfeited in favor of the government in case the operator does not fulfil the performance obligation

### **Response of PLDT**

In response to the governments directives regarding operators responsibility for provision of quality of service, PLDT has undertaken an aggressive marketing and expansion plan named "operation Zero Backlog". It promises to provide 1.2 million lines to remove the existing backlog within the next three years.

## **Assessment of Policy Changes**

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Philippines telecom sector has undergone major structural changes. From being dominated by a single large private provider, it has reached a stage where there are many players in the market. The range and scope of services has increased tremendously.

In terms of the sequencing of reforms proposed in an ITU Report [1989], the fundamental underlying issue that must be addressed in telecom reform is effective separation of the basic function of policy making, operational management and regulation. The second level consideration is that of access to capital and human resources. The third level concern is introduction of competition for efficiency in the telecom sector. Competition is considered to be a more important factor than ownership in introducing efficiency. Further, the order in which structural adjustments take place will also determine their effectiveness [Melody, 1990]. It is also argued that before separation of policy, regulation and operations and introduction of competition, a firm regulatory regime must be in place.

### **Separation of Policy, Regulation and Operations**

In the Philippine context, it may be observed that the government has played an active role in shaping the telecom sector. It is both the policy provider and regulator besides being a minor operator. Though the sector is regulated by a separate agency, NTC, it is under the DOTC. NTC claims to be autonomous in decision-making, but it gets its budget and staff support from the DOTC. Since NTC is under the DOTC it is likely that regulatory guidelines flow from the government, rather than emerging out of the needs of the sector.

With PLDT being the dominant player, and the regulatory body being constrained by staff and resource crunch, it is likely that PLDT's influence on regulation is strong. The emergence of other players such as Philcomsat, Philtel etc would mitigate the extent of PLDT's influence on the regulatory body directly. However, PLDT could still influence in a major way the mandatory interconnection policy, both in terms of the interconnecting technology and tariff by virtue of having the largest network in place.

Most developing countries undertaking a reform process face complex sets of issues and dilemmas as well as resistance to change. Political expediency often leads to ad-hoc decisions. For example, Thailand, India, Indonesia etc are examples of countries, which are facing problems in creating the

required institutional framework for affecting the functional separation [Jain, 1993]. In India, structural reforms related to reorganizing the sector have been taken in bits and parts. The government does not have a coherent plan. It set up a new organization called Telecom Commission in 1989 to formulate policy and regulate the monolithic Department of Telecommunications. Today, the Commission has effectively no role and the Department continues to be the policy-maker, regulator and operator. Similarly, in Thailand, the carving out of Telephone Organization of Thailand and Communication Authority of Thailand from the Department of Telecommunications effectively reduced the department's role to carrying out routine jobs and did not lead to the creation of a strong regulatory body. In Indonesia, the ministry does part policy formulation and regulation. This is because there are no guidelines for provision of licenses, interconnection mechanisms, transfer pricing. Each case is dealt with on an individual basis. Examination of the interface between regulation and operation, shows that since PT Telekom is the largest operator, and the regulatory body is ill-equipped to devise and regulate standards, PT Telekom has become the de-facto regulator in this area. The distinction between regulation and operation would come about when there is an independent regulatory body which is uninfluenced by the dominant players. [Jain, 1994 (a) and (b)].

### **Competition**

Competition exists only in award of franchise, not in service provision. Competition in service provision would have brought about efficiency in the sector. Given that it is the Congress and not NTC that actually awards licenses, there are chances of political leveraging in these awards.

### **Financing**

The government has been able to channelize development assistance funds to a number of private operators by acting as their guarantor. The government would need to ensure that these operators are able to generate sufficient revenue to enable them to repay their loans. It would need to devise systems to ensure that loan repayment defaults do not occur. Even if the government takes over the defaulting operator, it would need to have skilled staff to be able to manage the facilities in an efficient manner.

The government has identified several mechanisms for funding development. The government plans to channelize all development funds procured for this sector into a consolidated telecommunication development fund. These funds could then be channelized to local operator through accredited financial institutions such as Philippine Development Bank. These could be loaned to the operators either as peso or foreign currency loans. Domestic currency loans would be at the prevailing prime market rate, with the related foreign exchange risk being borne by the government. For the foreign currency loans, the borrower would shoulder the foreign exchange fluctuation risk.

The government has been able to identify mechanisms for involving the Asian Development Bank and the World Bank in evaluating, negotiating and administering umbrella co-financing schemes without charging any fees or commission. The government may seek access to foreign capital through attractive build-operate-and-transfer mechanism by ensuring a smooth overall economic environment.

The NTC plans to review the fixed rate of return for the regulated carriers. The current 12% rate could become more market based and dependent on prevailing interest rates. The revised allowable rate of return could be tied up with implementation of financial standards such as debt:equity ratio of 60:40, current ratio of 1:1 and manpower to line ratio of 1:40.

### **Access to Human Resources**

Other constraints to development are likely to be shortage of manpower in technical areas, specially in emerging technologies and management. Rough estimates of the required staff are approximately

161,000 trained personnel by 2010.<sup>1</sup> At present only around 37,500 trained people are available. The government or any professional agency could seek to strengthen the existing resources of Telecommunications Training Institutes and the PLDT school by establish training programs with assistance from some of the regional technical and management schools. Some of the development assistance funds need to be specifically set aside for this purpose.

With the growth in private sector and the demand for telecom services, it is likely that salaries in the private sector are likely to be high. It would then be difficult for DOTC and NTC to retain competent staff unless government salary structure is revised.

Using the ITU framework to assess the Philippines initiative, it is found that separation of policy and regulation is still not very effective. Though a firm regulatory regime exists in theory, practically, it would be difficult to implement it, given the present resource base of NTC.

### **Regulatory Issues**

Even though NTC has detailed out a number of regulatory guidelines, there are other critical regulatory issues which NTC must address.

Some of NTC's regulatory role is diluted by having to share the authority of granting franchises with the Congress and the local governments. NTC is authorized to grant only a Certificate of Public Convenience to the operator. The franchise is granted by the government. This could effectively mean political interference in a market which operates under a regulated competition.

NTC has attempted to design systems to ensure interconnection and grapple with the problem of access charges. Despite devising performance measurement systems, NTC has not been able to effectively monitor quality of service provided by telephone operators. NTC is hampered by lack of adequate staff and systems and requires skilled staff to devise and monitor performance standards, especially in emerging areas of technology. This lack is more acutely felt especially since NTC is attempting to evolve multi-dimensional criteria for assessment by taking inputs from a variety of sources such as equipment providers and bankers.

Though NTC requires that all operators submit their annual financial statements, not all of them do so regularly. In addition where the reports are submitted in time, they may not be in a form to permit analysis. NTC must therefore design systems which will enable it to analyze data and ensure adequate build-up of internal capability to utilize the available data.

NTC plans to review the reporting requirements and make it dependent on the scale of operations. Thus, a smaller firm involved in a single business may submit a simpler form and a firm involved in multiple segments may be required to fill out a more detailed form.

To strengthen the NTC, the government is considering passing a bill (NTC Reorganization Bill). The DOTC also plans to set up additional departments to assist and provide services to the smaller private operators for financial, operational and technical assistance. The government also plans to set up a Standards Office, which would be an inter-agency unit to evolve and design standards for network and other emerging technologies.

### **Service Expansion**

The government has successfully provided a framework for service expansion by mandating interconnections between various providers. It has also ensured that the private sector does not confine

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1 National Telecom Development Plan, 1992

itself to the more profitable urban sectors by making some of the under-served areas an integral part of a more profitable franchise area.

Major constraint to service expansion is likely to be funds. The smaller carriers in the private sectors would be unable to generate funds for expansion. The government plans to encourage merger of smaller carriers to enable them to achieve economies of scale.

### **Support for Local Manufacture**

The government would have to take active steps to encourage the indigenous industry either by seeking joint ventures with multinationals or implementing supportive schemes for the domestic industry. But considering that some of the emerging technologies such as value added networks and cellular mobile require state-of-the-art equipment and skills, joint ventures would be a better option. The contracts with foreign companies should ensure not only technology transfer but also building up of local capacity both in technical and managerial skills. Regional collaboration with other ASIAN countries which are in the process of undertaking reform programs and which have very similar domestic environments could be useful.

The government is also considering changes in other areas to spur growth in the telecom sector. There are plans to reduce import duties on capital goods and provide income tax holiday etc to encourage domestic firms to enter this area.

## **Conclusions**

The Philippines government has undertaken a number of specific measures and structural reforms to ensure development in telecom sector. Though the reform program addresses a number of critical issues such as private participation, mandatory interconnections, mechanism for funding and regulatory issues, it leaves some of the crucial issues unaddressed. These issues are separation of policy from regulation an introduction of competition. These would need to be addressed to ensure that the anticipated benefit of reform become available.

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**Exhibit 1: Number of Exchanges and Main stations of Local Telephone Service Carriers (1991)**

Carrier	Exchange		Main Stations	
	No.	%	No.	%
PLDT	133	47.3	633,968	93.8
Other Private Carriers	91	32.4	37,464	5.5
Government Carriers	57	20.3	4,511	0.7
Total	281	100.0	675,943	100

**Exhibit 2 : Switching Technology**

Technology	Percentage
Analog	38.8
Other electromechanical	7.4
Digital	5.3
Step-by-step	48.5

Exhibit 3: Summary of Physical Targets

Criterion	1992 Status	Target Status	Target Year	Addl. Manpower Req.	Investment Cost (\$ million)
1. Main Stn. Density per 10 Inhabitants	1.4	3.8	1998 2004 2010	84,346	16,151.8
2. Percentage of Municipalities with Local Exchange Service	0.6%	50.0% 75.0% 100.0%	2000 2004 2010	5438	1,017.7
3. Telephone Quality of Service				Minimal	17.6
Monthly trouble rate	18%	10% 5%	1998 2004		
Trouble response within 2 days	89%	90% 98%	1998 2004		
Service application response within 4 weeks	65%	94% 98%	1998 2004		
Other Standards	N.A.	To be set by NTC			
4a. Percentage of Municipalities and Cities with access to Public Switched Data Network [a]	2.5%	31% 46% 52%	1998 2004 2010		
4b. Percentage of Municipalities and Cities with access to Non-Switched Digital Data Circuit	12%	41% 46% 52%	1998 2004 2010	5,075	151.5
5. Establishment of Nation wide Maritime Communications in Accordance with global Maritime Distress and Safety System (GMDSS)		100%	1999	72	4.1
6. Percentage of Barangays with Public Calling Office (PCO) Service	22%	25% 38% 51%	1998 2004 2010	64,500	2,786.6
7. Cellular Mobile Telephone Service Availability [b]				4,855	7,859.4
Metro Manila & Cebu	Available	Digital CMTS	1993		
Percentage of Municipalities and Cities with CMTS		100% of MUCs 70% of KDCs	2010		
8. Integrated Service Digital Network (ISDN) Trial Exchanges [c]				Minimal	3.6
Manila	None	In Operation	1994		
Cebu	None	In Operation	1995		
Total				159528	26,974.6

- Notes:
- Locations for data services correspond to Major Urban Center (MUCs) and Key Development.
  - PCO Service to the barangays could use a mobile technology overlay with fixed subscribers.
  - Future ISDN Targets would be predicted on further study and the results of the trial.
  - Local Exchange Service target is part of the main Station Density Target.

**Exhibit 4: Investment Requirements to meet Telephone Main Station Density Targets**

Targets	1993	1994	1995	1996	1997	1998	1999-2004	2005-2010
Target Density (Main Stations. per 100 inhabitants)	1.8	2.0	2.1	2.6	3.5	3.8	6.2	10.0
Popn. [a] (Million)	64.9	66.6	68.2	69.5	70.8	72.1	79.7	88.2
Main Stns. connected (million)	1.18	1.35	1.39	1.84	2.49	2.75	4.96	8.8
Exchange Lines Equipped [b] (million)	1.1	1.35	1.30	1.84	3.03	3.3	5.9	10.70
Incremental Lines ('000)	399.0	164.0	44.0	444.0	1195.0	308.0	2639.0	4721.0
Investment (1992 values)								
Foreign Exchange (\$ mil)	479.5	60.6	10.6	305.6	640.5	247.2	2111.4	3777.7
Local Currency (P Bil)	9.5	1.1	0.1	8.5	18.3	7.1	60.4	108.0
Investment (Escalated [c])								
Foreign Exchange (\$ mil)	494.4	64.4	11.6	345.3	746.1	296.9	2849.9	5266.8
Local Cur. (P Bil.)	10.3	1.3	0.1	11.8	27.4	11.4	131.7	373.8

- Notes:
- Population estimates are based on National Statistics Office forecasts.
  - The supply forecast assumes a two-year provisioning period where demand is addressed two years earlier to accommodate investment phase. No additional investments were assumed prior to 1997 during which existing approved projects (PLDT's X5/X5C/X6, the Government's NTP, and PAPTELCO PROJECTS) are in progress. Exchange line estimates assume that all future lines will be single lines. Allowance has been made to phase out all step-by-step equipment, and hence party lines, within this time period.
  - The investments have been escalated per Table IV-12.

### Exhibit 5: Technology Standards

- Cellular mobile telephone equipment based on AMPS standard
- Multiple access subscriber radio system (IRT 2000 by TRT and SR 500 by SR Telecom)
- Single/Two Channel radio (Exicom and Telemobile)
- Rural Exchanges (GX 5000 by Mitel and MDX-384 by Redcom)
- Small Earth Stations (SCPC DAMA and MCPC) Multiple channel per carrier - Single channel per carrier with Demand Assigned Multiple Access.

