Construction of the MRT-3 extension
Photo by: Leody Barcelon

05 Accelerating Infrastructure Development

Accelerating Infrastructure Development

The Plan's infrastructure development program aims to contribute to inclusive growth and poverty reduction. It will support the performance of the country's economic sectors and ensure equitable access to infrastructure services, especially as these affect the people's health, education, and housing. Toward these ends, the government will accelerate the provision of safe, efficient, reliable, cost–effective, and sustainable infrastructure.

Crosscutting Strategies

Low levels of investment in infrastructure are directly caused by the country's tight fiscal situation.

Inadequate project preparation, poor project quality-at-entry, and poor project execution cause delays and changes in project scope and raises costs in the course of implementation.

The country's inadequate infrastructure has been identified as a critical constraint to economic growth[1]. This inadequacy, in both quantity and quality, is the result of low levels of public and private sector investments in infrastructure, which fall short of the requirements of a progressive economy and a growing population. Moreover, inequitable access to basic infrastructure services has also become an obstacle to poverty reduction and, more generally, to inclusive growth because it limits the opportunities for economic and social advancement available to marginalized sectors.

To accelerate infrastructure development and offer equitable access to infrastructure services, the following objectives and strategies shall be pursued across all infrastructure subsectors:

To Optimize Resources and Investments

Low levels of investment in infrastructure are directly caused by the country's tight fiscal situation. Notwithstanding the measures to address the narrow fiscal space discussed in Chapter 2, the following strategies need to be implemented to make the most of available resources and investments in infrastructure:

Improve Project Preparation, Development, and Implementation

Inadequate project preparation, poor project quality-at-entry, and poor project execution cause delays and changes in project scope and raises costs in the course of implementation. All of these significantly reduce the project's value and hamper the attainment of project objectives.

To address this problem, the following policy reforms[2] shall be implemented:

- Strengthening the capacity of NEDA and other government agencies in Value Engineering/ Value Analysis (VE/VA) and Risk Analysis and Management to ensure that infrastructure projects are not overdesigned or overspecified and to minimize cost-overruns, project

[1] See ADB. Philippines: Critical Development Constraints, ADB Publications, December 2007, p.1-62 and C.F. Habito. An Agenda for High Inclusive Growth in the Philippines. ADB Publications 2010, p. 1-61.

[2] These reforms were recommended under the 2009 Philippines-Australia Partnership for Economic Governance Reforms (PEGR)-funded Reform Agenda 006-07 on Institution Strengthening of the NEDA and other oversight agencies on value engineering, contract preparation, and performance monitoring of infrastructure projects

implementation delays, and changes in scope of works;

• Incorporation of VE/VA and Risk Analysis in the guidelines and processes of the NEDA Investment Coordination Committee (ICC);

• Development of Model Transaction Documents/ Contracts that may be uniformly applied to PPP projects of national government agencies (NGAs) and LGUs[3]; and

• Monitoring, management, and evaluation (MME) of PPP projects for the immediate mitigation of potential problems during contract implementation, while maintaining clear lines of accountability between contracting parties and the oversight agency.

To assist agencies in project preparation, a fund to support the conduct of feasibility studies may be established. This fund will ensure that feasibility studies are undertaken in a timely and correct manner.

With regard to PPP projects, NEDA-ICC approval of business cases shall be secured before proceeding to full feasibility studies to save on project preparation costs. This shall include the "go or no-go" decision on a project at an early stage and shall be required of all PPP projects irrespective of modality.

Synchronize Planning and Budgeting

The MTEF and the OPIF represent substantial progress in ensuring the consistency and responsiveness of the expenditure program with the national development agenda of the government. Despite these, there is still a need to guarantee that only those infrastructure programs and projects that will generate genuine economic benefits and are consistent with established development plans will be adequately funded for timely implementation.

By synchronizing the prioritization of programs and projects on one hand and allocating appropriate funding across government agencies on the other, the government ensures that only programs and projects that are strategic and critical to the realization of developmental goals shall be prioritized for funding. As a prior step, however, government agencies must demonstrate that proposed projects indeed make positive net contributions to national economic and social welfare.

Development initiatives across infrastructure subsectors shall be coordinated and integrated. Intended outcomes are better realized if there is a coordinated and integrated strategy for infrastructure initiatives.

Coordinate and Integrate Infrastructure Initiatives

Development initiatives across infrastructure subsectors shall be coordinated and integrated. This ensures that the requirements of these subsectors are addressed within the fundamental levels of the infrastructure sector and that their contributions are fully utilized. Intended outcomes are better realized if there is a coordinated and integrated strategy for infrastructure initiatives.

LGUs play a key role in infrastructure development. While local autonomy is duly recognized, the financial and technical

[3] Specific BOT/PPP model transaction documents/contracts have already been developed for four subsectors namely: (a) urban mass rail; (b) bulk water supply; (c) solid waste management (SWM); and (d) ICT. A contract drafting tool which aims to encompass all other projects and sectors not covered by the four model contracts has also been developed. The model contracts and the contract drafting tool are both posted on the NEDA website under the "Programs and Projects" section.

capacity of LGUs must be enhanced if they are to become more effective development partners. Their capacity for planning must also be improved so that local and national plans can be harmonized.

To aid planning and project development, the collection, management, and integration of key infrastructure and related data both at the national and local levels will be improved.

To attract Investments in Infrastructure

Improving investor confidence is necessary in order to generate additional financing and attract service providers. Both, in turn, ease the burden of government in providing infrastructure. The following strategies aim to make the country an attractive destination for investments by establishing a stable, consistent, and transparent policy environment and by reducing the money- and time-cost of doing business:

Improve the Institutional and Regulatory Environment of the Infrastructure sector

Regulatory agencies play a vital role in infrastructure development since they strongly influence, for good or ill, the provision of existing infrastructure services and the levels of forthcoming investments. They also affect the accessibility of such services, particularly the rates at which these are made available.

Improving the regulatory environment for infrastructure therefore becomes contingent on institutional reforms, which will involve:

a. the separation of operation and regulatory functions of agencies in order to remove conflicts of interest that arise naturally when such functions are performed by a single entity;

b. the establishment of an independent body that consolidates in itself all regulatory functions to support the provision of public infrastructure services in subsectors with multiple regulators;

c. the creation of a regulatory framework where this is lacking and necessary; and

d. the strengthening of regulatory institutions through capacity building and reinforced independence.

Regulatory agencies should pay special attention to vertical integration trends in supply and distribution utilities. These may facilitate transfer-pricing and result in inefficiencies from the supply side to the distribution side. This issue becomes critical in sectors where natural monopolies are present, such as energy and water, where returns on investment are guaranteed and where distribution is regulated while supply is not.

Encourage PPPs

The huge investment requirements of the infrastructure sector, coupled with the government's need to observe fiscal discipline, means that government shall tap the private sector for the financing, construction, operation, maintenance, and rehabilitation of major infrastructure in high-priority areas, such as transportation, power and water.

To this end, the environment for the implementation of PPPs shall be improved by revisiting the following guidelines and policies:

a. RA 7718 and its Implementing Rules and Regulations (IRR);

b. Guidelines and Procedures for entering into Joint Venture (JV) Agreements between Government and Private Entities; and

c. RA 9184 or the General Procurement Reform Act.

The objective of the review shall be to clarify ambiguous provisions and streamline the procedures and processes of project approval and implementation. Experience during the global financial crisis and constraints encountered by concerned agencies in processing and implementing PPP projects will also be considered to make these guidelines and policies more responsive and attractive to the private sector.

To Foster Transparency and Accountability in Infrastructure Development

Encourage Stakeholder Participation

Government shall encourage the active participation of the public and civil society in governance, monitoring, and feedback. Transparency and accountability are integral to a predictable policy environment conducive for investment.

To Adapt to Climate Change and Mitigate the Impacts of Natural Disasters

Institutionalize CCA and DRRM in Infrastructure Development.

The impacts of climate change and natural disasters add to the country's infrastructure problems and hamper resolution of the constraints earlier discussed. Hence, CCA and DRRM will be institutionalized in infrastructure development.

Plans and designs should include the possible effects of climate change and natural disasters in order to develop disaster–resilient infrastructure and help mitigate the adverse impacts of climate change. LGUs should also incorporate CCA and DRRM strategies into their respective plans, programs and budgets to allow timely, efficient and effective mitigation and disaster response at the local level.

To Provide Productive Employment Opportunities

Adopt a Labor-Intensive Scheme Where Applicable

Infrastructure can contribute significantly to local employment generation and can harness skills and technical expertise of the workforce. To provide productive employment opportunities that will contribute to inclusive growth, the infrastructure sector shall adopt an employment–intensive or labor–based scheme whenever it is most optimal in infrastructure development. Safety and health in public works undertakings shall be ensured at all times.

The impacts of climate change and natural disasters add to the country's infrastructure problems and hamper resolution of the constraints earlier discussed. Hence, CCA and DRRM will be institutionalized in infrastructure development.

Infrastructure Subsectors

Transport

Assessment, Issues, and Challenges[4]

In the MTPDP 2004–2010, the development of the country's transport infrastructure was principally aimed at the decentralization of progress and development by providing opportunities for growth, especially in regions and areas adjacent to Metro Manila. Towards that end, the following major thematic areas in transport were pursued and became the primary focus of both public and private investment: (a) the development of the nautical highway system and road-roll-on/roll-off (RORO) terminal system linking the entire country; (b) the development of tourism infrastructure

[4] Source: Updated MTPDP 2008–2010

to provide access to major tourism destinations; (c) the affirmative action for peace and development in Mindanao and other deeply impoverished areas; and (d) the decongestion of Metro Manila and the spread of development to adjacent regions.

Facilities for RORO have been built or rehabilitated in 22 ports identified under the Strong Republic Nautical Highway (SRNH), with 42 RORO ships operating in the identified SRNH routes run by 25 shipping operators as of the end of 2009. Economic gains have been recorded in connection with the intermodal road-RORO terminal system (RRTS) connecting Mindanao, Visayas, and Luzon, with a reduction in travel time by around 12 hours and a reduction of transport cost by 37-43 percent for passengers and 24-34 percent for cargo. The Subic Bay Port Development Project was also completed and was expected to generate significant benefits with the increase in the port's container capacity from 100,000 to 600,000 TEUs (20-foot equivalent units).

The Subic–Clark–Tarlac Expressway (SCTEx), linked to the existing North Luzon Expressway (NLEX), was also completed and has been operational, reducing travel time from Subic to Manila and from Tarlac to Manila. The construction of the Tarlac-Pangasinan-La Union Toll Expressway (TPLEx) extending the SCTEx from Tarlac to La Union is ongoing and is expected to relieve traffic congestion along the existing Manila North Road. In the Southern Luzon Corridor, the completion of the Batangas Port Development Project and the Southern Tagalog Arterial Road (STAR) Expressway will pave the way for the development of the industrial belt south of Metro Manila.

With respect to roads and bridges, the completion of substantial improvement and rehabilitation is expected to reduce transport costs and induce economic activities, particularly in the rural areas. As of December 2009, 22,468 km. (75.15%) of all national roads had been paved, of which of 13,525 km. were national arterial roads and 8,943 km. national secondary roads. Meanwhile 93 percent of the total 314,456 linear meters of national bridges have been made permanent. As for local roads, of the 30,924.76 km. of existing provincial roads, 30.2 percent or 9,345.15 km. have been paved, while 69.5 percent, or 21,464.50 km, are unpaved, with 0.4 percent or 115.11 km. of still undetermined condition. Of the 14,810.44 km. of city roads, 61.7 percent, or 9,138.348 km. have been paved and 35.8 percent, or 5,308.220 km, are unpaved, with 2.5 percent or 363.872 km. of undetermined quality.

Major tourist destinations identified in the previous Plan included Cebu–Bohol–Camiguin, Clark–Subic, Cordillera, Davao, Ilocos, Boracay, and Palawan, among others. To serve Panay Island and its immediate environs, the New Iloilo Airport was completed in June 2007. The New Bacolod (Silay) Airport for Negros Island destinations was inaugurated and opened for operations on January 18, 2008. The Caticlan Airport is currently being rehabilitated, and the Kalibo Airport's terminal building was initially expanded to cater to the increasing visitor traffic to Boracay Island and nearby destinations. To serve the Cordillera area, the facilities of the San Fernando Airport in La Union were upgraded, while the first phase of improvements on the Busuanga (Coron) Airport in Palawan was substantially completed.

On the goal of developing Subic–Clark as an Asian logistics center, the Civil Aeronautics Board (CAB) approved and published the IRR of EO 253 expanding air services at Diosdado Macapagal International Airport (DMIA) and Subic Bay International Airport (SBIA). Developments at DMIA include the expansion and rehabilitation of the existing passenger terminal and the installation of radar equipment to enhance the safety of

flights, as well as to ensure round-the-clock airport operations even in adverse weather. The CAB and the RP Air Panel negotiated air services agreements (ASAs) from 2006 to 2010 with Singapore, Turkey, Oman, Russia, Libya, Cambodia, United Kingdom, Spain, Brunei, Australia, Kuwait, UAE, Qatar, Malaysia, Finland, Iran, Thailand, Netherlands, Hong Kong, Canada, Macau, Palau, Bahrain, People's Republic of China, India, Japan, Republic of Korea, Nepal, and New Zealand. These agreements resulted in increases in capacity entitlements, new routes, more access points, multiple airline designation, and airline cooperative arrangements. The CAB was able to negotiate an average of 200–300 tons capacity per week for cargo, which covers Manila, Subic, Clark, and other points in the Philippines.

While there are completed and ongoing transport projects implemented through PPP under the BOT Law, private-sector participation in transport infrastructure development has been continually enhanced to augment the government's budgetary support for capital investment. This effort included the development and construction of expressways, railways, and airports; the privatization of individual ports or groups of ports; and the operation and maintenance of transport facilities. For the roads subsector, the JICA-assisted Master Plan on High Standard Highway Network Development, which identified a long list of potential PPP expressway projects, was completed in July 2010. In addition, the Preparatory Survey for PPP Infrastructure Development Project, which aims to identify bottlenecks in PPP project implementation and select priority infrastructure projects, is underway and close to completion.

Some of the maintenance of land transport assets (i.e., maintenance of national, provincial, and city roads nationwide; improvement of drainage; installation of adequate traffic lights, and road safety and pollution monitoring devices) had been undertaken in the last few years using revenues from the Motor Vehicle Users' Charge (MVUC). Objectivity in the prioritization and allocation of resources for national road maintenance was also enhanced using a computerized system with comprehensive and up-to-date technical and economic criteria and data. For local roads, an incentive-based policy reform program is currently underway. This uses incentives or grants to finance road maintenance and rehabilitation to motivate LGUs to institute policy reforms in local government systems and processes, and improve performance in road rehabilitation and maintenance and other service delivery.

Despite notable accomplishments in the transport sector, the institutional and bureaucratic reforms proposed under the previous Plan seeking to separate the operation and regulation functions of transport agencies have not been achieved. This notwithstanding, the civil aviation subsector underwent a degree of reorganization with the enactment of RA 9497 on March 4, 2008 creating the Civil Aviation Authority of the Philippines (CAAP). RA 9497 grants the new body fiscal autonomy through the corporatization of the preceding civil aviation agency, while retaining its technical regulation functions over the civil aviation industry. The economic regulation functions meanwhile rest with the CAB. There is a need to pursue a full restructuring of the air transport organizations as well as those for the ports and for rail transport.

To become globally competitive and address safety issues, especially those raised by civil aviation stakeholders, the government is implementing the Communications Navigation Surveillance/Air Traffic Management (CNS/ATM) system in accordance with International Civil Aviation Organization (ICAO) standards. A similar project was completed in 2004—the Nationwide Air Navigation Facilities Modernization Project (Phase 3)—to replace ageing air navigation equipment.

Likewise, maritime safety measures have been pursued in domestic shipping in compliance with International Safety Management (ISM) and National Safety Management (NSM) codes and the Maritime Industry Authority (MARINA) Ship Safety Inspection System. Ship inspection has also been enhanced through the Japan International Cooperation Agency (JICA)-assisted Project on the Enhancement of Ship Inspection completed in 2005. A MOA between MARINA and the Philippine Coast Guard (PCG) to implement ship safety inspection was signed on September 14, 2005. To strictly monitor compliance by ships and to enforce maritime safety rules and regulations by deputized maritime enforcers, MARINA, on March 16, 2009, signed a memorandum of understanding (MOU) with the PCG, Philippine National Police-Maritime Group (PNP-MG), the Union of Local Authorities of the Philippines (ULAP), and the Liga ng mga Barangay (LNB). In 2010, a total of 356,831 mandatory predeparture inspections (MPDI), 992 port state control inspections, and 5,476 Safety of Life at Sea (SOLAS) compliance inspections were conducted by the PCG.

Compliance with international maritime security standards has been implemented through the adoption of the International Ship and Port Facility Security (ISPS) Code. Vessel Traffic Management Systems (VTMS) have been installed in the Port of Manila, Corregidor Island, and the Port of Batangas following the security provisions of the Code. There are plans for the installation of similar standards in other major ports.

In 2005, the Study on Wooden-Hulled Ships (WHS) recommended standards, rules, and regulations for the continued operation of existing wooden-hulled ships, and the construction, safety, and operation of new ones. On October 27, 2010, the Rulebook on the Construction and Repair of Wooden-Hulled Ships and Wooden-Hulled Boats with Outriggers was approved by the MARINA Board. As part of the domestic shipping fleet modernization program, MARINA entered into a MOA with the Development Bank of the Philippines (DBP) Maritime Leasing Corporation (now, DBP Leasing Corporation) on June 2, 2008. The aim is to provide loan facilities to qualified ship owners or operators who are interested in the acquisition of RORO ships to be deployed in SRNH routes. As of June 2010, seven companies have availed of the said facility involving the acquisition of 12 RORO ships. EO 588, entitled "Strengthening the Philippine Shipbuilding and Ship Repair Sector and Instituting Measures to Promote Its Growth and Development", was issued on December 8, 2006. This mandated the formulation of a Comprehensive Development Plan for the Philippine Shipbuilding and Ship Repair Industry that was completed on October 16, 2007 and subsequently endorsed to the Office of the President on December 3, 2007 together with the draft memorandum circular directing the implementation of the Plan.

To further promote the development of domestic shipping, RA 9295 entitled an "Act Promoting the Development of Philippine Domestic Shipping, Shipbuilding, Ship Repair and Ship Breaking, Ordaining Reforms in Government Policies towards Shipping in the Philippines and for Other Purposes" was enacted on May 3, 2004. The law deregulated the domestic shipping industry by allowing domestic operators to set their own passenger or cargo rates, hence promoting investments in the industry.

Notwithstanding the accomplishments in the transport sector, several issues and challenges still remain to be addressed, such as the following:

Lack of Integrated and Coordinated Transport Network

A major shortcoming of the sector is the absence of an integrated and well-

coordinated national transport plan that will guide the prioritized funding and implementation of transport projects, as well as the physical planning and intermodality of transport infrastructure. This situation is likely a consequence of the current institutional setup characterized by weak coordination, regulation, and oversight for transport policies and plans.

The lack of integration between national and local government plans and programs/projects is also a major problem that results in gaps in the transport network, contributing to the low capacity and quality of infrastructure facilities. This is partly a consequence of the insufficient capacity of LGUs to finance and manage local projects, particularly roads, and the lack of national government funds to maintain the existing national transport infrastructure base.

Global assessments of the country's transport infrastructure network indicate that its quality and capacity remain low. These deficiencies stem mainly from inadequate and unreliable funding for construction and development of transport infrastructure, as well as for the management and maintenance of existing transport infrastructure assets.

To promote productivity and trade competitiveness, seamless multimodal transport networks and logistics systems are needed. The MTPDP 2004–2010 recognized the need for a transport logistics system that will decongest Metro Manila by ensuring efficient linkages between its business centers and nearby provinces. In 2007, the Subic–Clark–Manila–Batangas (SCMB) Corridor, which connects the three regions accounting for two-thirds of the country's GDP, was envisioned as a major transshipment and logistics hub in the Asian region following the creation of the Luzon Urban Beltway (LUB) Super Region. The SCMB Corridor handles more than 80 percent of the volume of the national cargo throughput, but its potential is constrained by inefficient logistics operations and infrastructure support. This has primarily resulted in high transport costs of goods and services that has made the corridor less competitive. What is needed is a seamless multimodal logistics system along the SCMB Corridor to support intraregional trade and investment, an increase in the level of services of an integrated transport system, and an efficient flow of commodities, supplies, and inputs to tourism areas and various economic and industrial zones. Other strategic logistics corridors need to be identified and developed in a similar manner.

Overlapping and Conflicting Functions of Transport and Other Concerned Agencies

The institutional structure of the transport sector needs to be studied thoroughly to determine the most efficient institutional setup and the corresponding institutional reforms to improve the quality of transport service, and to prevent conflicts between different modes of transport that serve the same purpose. A requisite, however, is a long-term policy framework to achieve an integrated and well-coordinated national transport plan. This policy framework would also address governance issues in the sector by raising the level of accountability of decision-makers and serve as the basis for a multimodal transport plan to guide investment planning, programming, and prioritization, among others. Specific policies related to governance may be included in the policy framework to ensure that the public sector is performance-oriented and that outcome-based services are promptly delivered.

Transport Safety and Security Concerns

Road accidents are now the fourth leading cause of death in the Philippines according to the DOH. The ADB Regional Safety Program published in 2005 estimated the national cost of traffic accidents for the

Philippines at US$1.9 billion (or roughly 2.8 % of GDP). In addition, truck overloading continues to be a problem. According to a JICA-DPWH axle load survey in 2004 and a DPWH survey in 2005, about 11 percent of the 3-axle trucks and 12 percent of the 4-axle semitrailers were overloaded.

On the other hand, the maritime subsector's record in the area of safety is alarmingly bad, with an average of more than 160 accidents per year over the last decade. Maritime accidents are a major problem owing to a combination of factors such as: (a) a mostly retro-fitted and aging fleet; (b) underappreciation of cargo balancing on-board vessels; (c) loss of experienced crews to foreign shipping; and (d) natural disturbances.

A safe, secure, efficient, viable, competitive, dependable, integrated, environmentally sustainable, and people-oriented Philippine transportation system.

Additionally, the Federal Aviation Authority (FAA) of the US has downgraded the category of the Philippines' aviation capability in providing safety certification and oversight for international carriers, citing technical and regulatory deficiencies, among others.

Underdeveloped Transport Facilities in Conflict-Affected and Impoverished Areas

As a result of armed conflict and inequity in the distribution of income, economic activity and investments have been constrained in some areas of the country. In particular, conflict-ridden areas have experienced damages in their transportation network and have suffered from the disrupted delivery of basic services, thereby adversely affecting the people's welfare and the quality of life.

Strategic Plan and Focus

The current state and performance of the transport sector indicates gaps and bottlenecks that need to be addressed to support the government's thrust toward competitiveness and its development goals. What is envisioned is "a safe, secure, efficient, viable, competitive, dependable, integrated, environmentally sustainable, and people-oriented Philippine transportation system" that will focus the sector's development objectives and strategies on resolving identified issues and challenges.

To Ensure an Integrated and Coordinated Transport Network

1. Adopt a comprehensive long-term National Transport Policy (NTP)

To guide the accomplishment of transport objectives and goals and to improve governance in the sector, a comprehensive long-term NTP must be put in place. This will guide the restructuring of the transport sector into a well-coordinated and integrated multimodal transport system. The NTP should clearly establish the government's policies in the areas of resource generation and allocation; the criteria for the preparation of agency plans, programs and projects; cost recovery and subsidies; regulations for passenger transport services; urban transport and settlements; transport logistics; and governance. In the interim, the NTP shall be operationalized through an executive order, and in the medium-term, through a legislative enactment. The NTP would eliminate uncertainty and lend predictability and consistency to government decisions, thereby promoting accountability.

With regard to PPP project implementation, policies related to risk allocation (e.g., allocation of regulatory risk), delivery of ROW, and government financial support for viability gap funding of transport projects will be established. Additionally, the NTP will institutionalize CCA and DRR strategies in recognition of the major impacts of environmental, geologic, and meteorological hazards on the

development and preservation of transport infrastructure. It will also promote a people-oriented transport system that mainstreams gender considerations.

The roles of the private sector vis-à-vis those of government agencies and other authorities as well as LGUs in the development, operation and management of various transport infrastructures will be defined in conjunction with the crafting of a NTP. For rail transport, for example, the government can be the primary developer of the railway infrastructure, while the private sector can be responsible for the operations and maintenance of the facility including the provision of rolling stock.

Likewise, the NTP shall consider the definition of the roles of national government entities and LGUs in transport infrastructure development and management (e.g., cost sharing policy/subsidy), notwithstanding the Local Government Code of 1991, including scope of duties and responsibilities, as well as the linking of national and local plans, and budget allocation.

The government will also address the inadequate linkage between the planning and budgeting processes to ensure that resources are allocated to their most important uses for transport infrastructure and management.

2. Develop strategic transport infrastructure and maintain/manage transport infrastructure assets

a. Prioritize asset preservation

While transport connectivity is of utmost importance, the upgrading of the quality and capacity of existing transport infrastructure will be prioritized before expanding the coverage of the networks. The latter will be based on a strategic plan that takes modal complementation into account. For rail transport, the quality of the existing railroad tracks and services must be upgraded.

In the allocation of resources, higher priority shall be given to asset preservation or maintenance and rehabilitation of the existing transport infrastructure network rather than new construction or development.

The "user-pays" principle shall be applied at the very least for the purpose of asset preservation. This principle may be invoked whenever pricing of the service is possible and potential users unwilling to pay for the service can be excluded. The same argument may be invoked for full investment-cost recovery. The focus shall be the upgrading of the quality and capacity of existing ports, roads, airports, and rail lines.

The "user-pays" principle shall be applied at the very least for the purpose of asset preservation.

The SCMB Corridor and other strategic logistics corridors must be developed to become seamless intermodal logistics corridors.

Additional funding for maintenance should be provided to heighten and effectively maintain existing infrastructure assets. The previous annual appropriation of PhP4 billion for road maintenance on top of the Road Fund should be reinstated. Budgetary allocation may be further augmented through the GAA. The government shall also enhance a "user-pays" culture in infrastructure management. As proposed under the previous Plan, RA 8794 ("An Act Imposing a Vehicle User's Charge on Owners of All Types of Motor Vehicles and for Other Purposes") may be amended to include a fuel levy or some other form of road user contribution in order to expand the Road Fund. For long-term sustainability, the stability of available and adequate maintenance funds shall be ensured. To ascertain the sustainability of local transport networks, an incentives-based reform agenda for LGUs shall be put in place, where applicable, to help LGUs improve their performance in transport infrastructure management and maintenance.

b. Provide access to major and strategic tourism destinations and production areas

Dependable transport access will be facilitated in coordination with LGUs

to support major and strategic tourism destinations. National and local coordination will be fostered to provide the necessary transport infrastructure to link production and agricultural areas to major roads leading to markets and population centers.

c. Promote environmentally sustainable and people-oriented transport

The government will continue to promote an environmentally sustainable and people-oriented transport system. The shift from the use of fossil fuel to renewable energy sources to power vehicles shall be pursued. Non-motorized transport facilities such as sidewalks, footbridges, underground walkways, and bicycle ways will be provided to ensure safety of pedestrians and bicycle users. Transportation design and systems shall consider the frail, elderly and differently–abled persons, among others.

The dual roles of agencies, and government entities that simultaneously serve as regulators and operators shall be addressed by establishing a separate and independent regulator (or regulators)

3. Develop an integrated multimodal logistics and transport system

a. Identify and develop strategic logistics corridors based on a National Logistics Master Plan

The SCMB Corridor and other strategic logistics corridors must be developed to become seamless intermodal logistics corridors. In support of this, a Logistics Master Plan shall be completed to guide overall development. This plan shall consider the intermodality of the transport network system, the industrial and area development plans and the identification of the necessary initiatives, programs, and projects. It will promote subregional economic-cum-logistics cooperation and will fully utilize the logistics systems that link the regions traversed by the logistics corridor (e.g., Central Luzon, Metro Manila, and Southern Tagalog for the SCMB corridor). The aim shall be an "economic corridor" where development benefits not only large cities but also smaller towns and rural areas along the corridor.[5]

The extension of the SCMB logistics corridor farther to the north and to the south will also be pursued. To support this, the viability of establishing an efficient long-distance, high-speed mass rail transit system, integrated with the mass transit commuter rail system in Metro Manila, shall be explored alongside the rationalization of the roles of various government agencies and entities concerned with mass rail transport development. The feasibility of freight-rail services for all strategic logistics corridors will also be considered.

b. Improve the RRTS

Interisland logistics shall be enhanced by further developing the RRTS. Studies on the domestic shipping industry shall also be undertaken to identify concrete measures to lower interisland shipping costs. Where needed, the maritime regulator shall intervene to ensure competition in the industry pursuant to RA 9295. Efforts to improve performance and efficiency in port operations shall likewise be pursued.

c. Explore ASEAN connectivity through sea linkages

The Philippine archipelago's proximity to other Asian countries is an obvious reason to explore the establishment of an ASEAN RORO Network, a Philippine initiative adopted as one of the "flagship" programs in the ASEAN Connectivity Masterplan during the 17th ASEAN Summit in Ha Noi, Viet Nam. In support of this initiative, the government shall study the development of existing RORO ports to accommodate international RORO ships as well as the necessary regulatory framework to promote such service. The development of port facilities through PPP to cater to cruise tourism, both servicing interisland and international cruise vessels, may also be explored.

[5] National Competitiveness Council (NCC)

d. Expand the Air Services

Full implementation of EO 219 shall be pursued. The Philippines shall allow airlines from foreign countries to fly to any airport in the country except Ninoy Aquino International Airport (NAIA), which is currently congested. The Government shall ensure that each participating foreign country shall reciprocate by allowing airlines from the Philippines to fly to any of its airports. Each foreign country may also exclude one of their major airports during the period of exclusion of NAIA. (Please refer to Chapter 2: Competitive Industry and Services Sectors).

To address the overlapping and conflicting functions of transport and other concerned agencies

4. Separate the regulatory and operation functions of transport and other concerned agencies

In line with the goal of separating the operation and regulation functions of transport agencies, the port, rail and air transport organizations shall be restructured. The dual roles of air, water, and rail transport sector agencies, as well as other government entities involved in the provision of transport infrastructure and services that simultaneously serve as regulators and operators shall be addressed by establishing a separate and independent regulator (or regulators) with jurisdiction over all airports, ports, or railways.

In rail transport, the policy, planning, and regulation functions shall be separated from the delivery of train services, which also serves to allow private sector participation. In the previous plan, the interim institutional strategy for the rail subsector was to establish a Strategic Rail Authority in the Department of Transportation and Communications (DOTC) for policy, strategy, and regulation. However, the long-term plan calls for an independent rail regulator. To encourage private sector participation, ROW acquisition and infrastructure shall be subsidized by national government appropriations, while private concessionaires provide the rail services.

To ensure transport safety and security

5. Comply with safety and security standards

Standards on safety and security shall be regularly upgraded and updated in keeping with international standards and practices and strictly implemented and enforced. Maritime safety and security will be enhanced through the ratification of maritime safety and security-related conventions. Road safety will be promoted through the implementation of the Road Safety Action Plan.

To promote development of conflict-affected and highly impoverished areas

6. Provide linkages to bring communities into the mainstream of progress and development

Transport networks in underdeveloped regions and conflict-affected areas shall be improved to open up economic opportunities and help solve peace and order problems.

Water

Water is a basic need and everyone has the right to be provided with access to basic services related to water. In addition, economic growth itself must be supported, specifically by meeting the needs of priority growth and production centers for water supply, sewerage, sanitation, irrigation and flood management. The water sector's greatest challenge is to balance equity and efficiency in the management of water resources to "ensure adequate, safe and

Water is a basic need and everyone has the right to be provided with access to basic services related to water. In addition, economic growth itself must be supported, specifically by meeting the needs of priority growth and production centers for water supply, sewerage, sanitation, irrigation and flood management.

sustainable water for all." Efficient and effective management of water resources is fundamental to achieving inclusive economic growth while ensuring a sustainable environment.

Crosscutting Issues and Strategies in the Water Sector

Assessment, issues, and challenges

Access to potable water and basic sanitation

MDG 7 commits the country to halving the number of people without access to water and basic sanitation by 2015. Meeting this target is a major challenge for a number of reasons. One, the lack of sector data presents a logistical challenge in the determination of priority waterless areas. Two, investments in water supply and sanitation have also been significantly low relative to overall public spending (World Bank 2005), which may be due to the lack of a coherent financing framework in the sector. Three, public infrastructure spending by the national government shows a bias for Metro Manila and other urban areas, including spending for water supply, sewerage and septage management. And four, the absence of a clear monitoring system makes it difficult to assess and address the sustainability of developed infrastructure.

The absence of a single lead agency to coordinate development in the water sector is one of the major hurdles to the efficient implementation of strategic water infrastructure. There are at least 30 agencies involved in the water sector, with specific but often overlapping or conflicting mandates for water supply, irrigation, flood management, pollution control, watershed management, financing, policy formulation and coordination

Inefficient and insufficient support for growth and production centers

The absence of a single lead agency to coordinate development in the water sector is one of the major hurdles to the efficient implementation of strategic water infrastructure. There are at least 30 agencies involved in the water sector, with specific but often overlapping or conflicting mandates for water supply, irrigation, flood management, pollution control, watershed management, financing, policy formulation and coordination, among others. This situation presents difficulties for effective coordination and implementation of projects and programs to sustainably meet water use and management. (e.g., in meeting the needs of competing users of water; linking water service provision with basic sanitation services; and ensuring effective and efficient flood risk reduction and management).

While the National Water Resources Board (NWRB) has the legal mandate for water governance, its existing structure and budget limit the exercise of its functions. To address the existing leadership gaps, the mandate of the Subcommittee on Water Resources (SCWR), initially created under the Committee on Infrastructure (INFRACOM) to ensure the implementation of the Philippine Water Supply Sector Roadmap, was expanded to become the key policy coordination body for the water sector. [6] Despite this, however, the sector remains weak in terms of regulation and allocation of water resources.

Furthermore, effective planning, target-setting, monitoring and implementation are impeded by the lack of up-to-date, integrated, harmonized and comprehensive data on the sector. Such data is significant in the development of new water sources; and in the design of CCA and DRRM mechanisms. But initiatives to establish a knowledge-sharing network among stakeholders in water have so far proved unsustainable since there is no clear framework and reliable financing for the continuous updating and improvement of access to information.

[6] The SCWR is an interagency committee for the Water Resources Sector established through NEDA Board Committee on Infrastructure Resolution No. 2, Series of 2008 composed of representatives from key national government agencies, leagues of cities and municipalities, academe and civil society. Its key function is to advise the NEDA Board and INFRACOM on policies and issues related to the Water Sector.

Strategic Plan and Focus

To address issues on equity and efficiency of access to water

1. Practice Integrated Water Resources Management (IWRM) in the sector

IWRM[7] has been identified as the overall strategy for: (a) the effective protection and regulation of water for security and ecosystem health; (b) the provision of responsive services for present and future needs; (c) the improved effectiveness, accountability and synergy among water-related institutions and stakeholders; and (d) adaptive and proactive responses to emerging as well as future challenges, such as CCA and DRRM. While the concept is widely accepted, however, IWRM practices have not been mainstreamed in policies, plans and programs. Similarly, integrating the ecoefficient approach[8] to the development of water infrastructure to support the desired transgenerational outcomes in the sector has yet to be realized. The experience of numerous recent instances of disasters, nonetheless, has raised awareness and increased the acknowledgement of the benefits of IWRM. Now is an opportune time, therefore, to implement coordinated activities to mainstream IWRM practices and promote the development of ecoefficient water infrastructure.

Because of the fragmented nature of the water sector, the establishment of a comprehensive and accessible information management system is necessary to ensure coordinated planning and implementation. Data collection methodologies have to be synchronized to support planning and budgeting of key programs and projects. Mechanisms that allow consistent updating and harmonization of raw data should be put in place alongside the sharing of such data among the relevant stakeholders, project developers, and key policy-makers.

2. Rationalize financing in the water sector to fulfill MDG commitments

The low level of investments in the water supply and sanitation sector hinder the achievement of the MDGs of the sector. The lack of a coherent financing framework must be addressed by rationalizing financing in the water sector to make the fullest use of limited public funds and encourage concessional financing, and private sector investments.

3. Work towards a lead agency for the water sector

A lead agency for the entire water sector should be ultimately developed. The lead agency should be able to assume the functions of policy making, coordination, and resource regulation for the sector. It shall be provided with sufficient capacity and authority to implement key policies, plans, and projects in the water resources sector. In the meantime, NWRB should be strengthened so it can continue its function as the sector's overall economic and resource regulator.

[7] IWRM promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

[8] Ecoefficiency is having "more value with less impact on the environment"; it emphasizes monitoring of material and energy flows of stocks and life cycle assessment. While ecoefficiency has been successfully integrated in industrial and business processes, its application in water infrastructure development will require the establishment of both physical and nonphysical infrastructures (i.e., policies, institutional framework, financing, etc).

4. Develop capacities of NGAs, LGUs, and water-service providers (WSPs) for the sustainable management of infrastructure and better service provision

The capacities of planning and implementing institutions must be developed to improve the performance of various structural and nonstructural infrastructures for the water sector. NGAs and LGUs should enhance their capacities in effective water governance, sustainable use of water resources, and planning for CCA, among others. LGUs and WSPs should be assisted in developing relevant, practical, and up-to-date management tools that support integrated water resources management and technologies. Service providers should likewise be capacitated in plan development, budgeting and operations, among others, in order to improve coverage, efficiency and sustainability of infrastructure.

Water Supply

Assessment, Issues, Challenges

Limited Access [9]

Most assessments show a limited overall coverage and low level of access to safe drinking water in many areas of the country. Among others, the World Bank (2005) noted a decline in access to improved water services from the late 1990s to 2002. The 2010 Report of the WHO/UNICEF Joint Monitoring Program on the MDGs[10] observed minimal increases in coverage over the past two decades, particularly in urban areas. Moreover, there is a wide disparity in coverage between urban and rural areas (see Table 5.1). Regional data further reveals a broad inequity of access even among rural areas.

The Philippines Progress Report on the MDG 2010, on the other hand, suggests that the sector is on track to attain its MDG commitment (Figure 5.1). Nonetheless, achieving 100-percent coverage remains a challenge, since 15.73 million people continue to have no access to a safe water supply.

Data on the number of service providers remain inconsistent and have not been consolidated. Notwithstanding this, Table 5.2 shows the approximate proportion of the population with access to clean drinking water within the scope of certain groups of formal service providers. Approximately 20 percent

Table 5.1 Estimated Coverage of Access to Water: 1990-2008

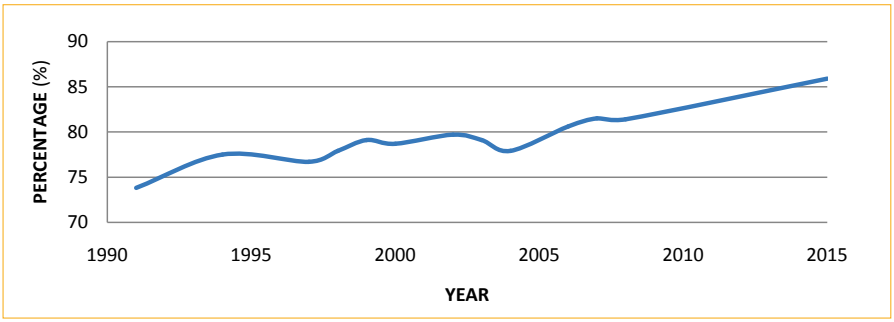
Year	URBAN AREAS (in %)		RURAL AREAS (in %)	
	Total	Household Connections	Total	Household Connections
1990	93	40	76	8
1995	93	46	79	13
2000	93	51	82	18
2005	93	57	85	23
2008	93	60	87	25

Source: WHO/UNICEF JMP 2010 Report

[9] Reasonable Access – availability of at least 20 liters per day from a source within 1 kilometer of the dwelling (World Bank and UNICEF Joint Measurement Programme: www.wssinfo.org, accessed 22 November 2010)

[10] The WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation is the official United Nations mechanism tasked with monitoring progress towards MDG-7 or halving the proportion of the population without access to water and basic sanitation.

Figure 5.1 Percentage Access to Safe Water



Source: Philippines Progress Report on the Millennium Development Goals 2010

Table 5.2 Levels of Access to Safe Drinking Water

Access to formal levels of service[/a]				Informal Access
Level 3: 45%		Level 2: 10%	Level 1: 25%	Self-provision through private wells, tanked or vended water supply or piped supply provided by SSIPs
WDs: 20%	POs: 5%	LGUs and CBOs: 20%	LGUs and CBOs: 35%	

Note:
WDs: Water Districts
PO: Private Operators (e.g., concessionaires, private developers, etc.)
CBOs: Community-based Organizations (e.g., rural or barangay water service associations, cooperatives, etc.)
SSIPs: Small Scale Independent Providers

Source: WB Report, Philippines: Meeting Infrastructure Challenges, 2005, as quoted in the NEDA Philippine Water Supply Sector Roadmap, 2010

(Footnotes)
/a As defined in NEDA Board Resolution No. 12, Series of 1995: Level I (point source) - a protected well or developed spring system without a distribution system; Level II (communal faucet system or standpost) - a system composed of a source, reservoir, distribution system and communal faucets; and Level III (waterworks system or individual household connections) - a system composed of a source, reservoir, piped distribution system and household taps

continue to rely on informal access, which are generally not considered sustainable.

Low Investment Levels and Lack of Financing for Waterless Areas

Investment levels are too low to meet the growing demand for water. Among the key constraints to expanded coverage and improved quality of service are the low tariffs which hinder cost recovery and prevent the accumulation of funds for new capital expenditures. While cost recovery has been identified as a principle of regulatory policy, there has been minimal progress to achieve it. Regulatory oversight has been highly fragmented, as exemplified by the existence of: (a) three entities–NWRB, LWUA and the different LGUs–that exercise primary regulatory functions; and (b) specialized regulatory bodies such as the Subic Bay Regulatory Board and Metropolitan Waterworks and Sewerage System–Regulatory Office (MWSS-RO). These institutions have different regulatory practices, processes, tariff-setting methodologies, and more importantly, overlapping functions or jurisdictions, resulting in variances in regulatory rules and enforcement across types of service providers. The lack of a single independent regulator for the water supply sector is a major reason for the absence of a clear regulatory framework with a credible and effective tariff methodology that is shielded from political intrusion, founded on accountability to consumers, and conducive to new investments to meet supply needs.

The program for waterless areas, which aims to provide water to 212 waterless barangays

The Philippines Progress Report on the MDG 2010 suggests that the sector is on track to attain its MDG commitment. Nonetheless, achieving 100-percent coverage remains a challenge, since 15.73 million people continue to have no access to a safe water supply.

The rapid increase in population resulting in the pollution of water systems and, in some areas, the exhaustion of groundwater reserves has quickly widened the gap between supply and demand for potable water, especially in tourism destinations, industrial areas and highly urbanized cities.

in Metro Manila and 432 waterless municipalities outside Metro Manila, has been allotted an annual budget of PhP1.5 billion. Because the administration of the funds was largely discretionary, 40 percent (212 municipalities) of 432 municipalities identified as beneficiaries of the fund were not even part of the original list.

Moreover, there is no clear policy framework to guide the financing of water supply programs and projects. Currently, financing originates from a variety of sources. National government financing is primarily administered through LWUA and MWSS or onlent through GFIs or the Municipal Development Fund Office (MDFO). Additionally, congressional funds for water supply projects are significant but uncoordinated and largely allocated to areas based on political considerations. Local government funding, on the other hand, has mostly been for operation and maintenance rather than capital expenditures. (World Bank 2005) Private-sector financing has been skewed towards Metro Manila, and, there has been limited private investment by water utilities and private households outside Metro Manila.

Lack of New Water Sources to Meet Existing and Future Demand in Growth Centers

The rapid increase in population resulting in the pollution of water systems and, in some areas, the exhaustion of groundwater reserves has quickly widened the gap between supply and demand for potable water, especially in tourism destinations, industrial areas and highly urbanized cities. Furthermore, extended dry seasons as a result of climate change are expected to exacerbate the demand for water. New water sources must be identified and developed to address this gap. The existence of financially viable areas for water supply means there is a good opportunity for the private sector to be engaged in source development.

Strategic Plan and Focus

To Address Equitable Provision of Water Supply and to Ensure Timely Provision of Water to Key Growth Centers

The following strategies[11] will be pursued:

1. Strengthen Economic Regulation

The creation of a single, independent economic regulator for water supply services is a priority strategy to address institutional fragmentation and the low level of investments in the sector. Legislative action is required to resolve the conflicting mandates of various agencies involved in the regulation of water services. Pending positive action from Congress, however, NWRB must be strengthened to allow partial resolution to the current situation. This interim action must also be supported by the formulation of a National Water Resources Policy (NWRP) to provide a policy framework for both economic and resource regulation in the water supply subsector.

2. Implement a priority program for waterless areas

Consultations with stakeholders affirm the need for a specific program that will ensure the achievement of MDG 7 by 2015 and continuing 100-percent access to water in the medium term. Critical to the new program for water supply, however, is identifying key beneficiaries based on an updated assessment and identification of remaining waterless

[11] The strategies herein identified are consistent with the Philippine Water Supply Sector Roadmap (PWSSR). The PWSSR is the water supply sector plan and guide with long-term development outcomes supported by medium-term strategies and annual operational plans formulated and subscribed to by the different national government agencies, along with other stakeholders. Implementation of the strategies stated therein is crucial to achievement of the development goal to provide "access to safe, adequate and sustainable water supply for all."

municipalities in the Philippines and ensuring sustainability of water service provision.

3. Develop sustainable new water sources to meet demand

A comprehensive approach, adhering to the IWRM framework for projecting the demand-supply gaps across the country and for planning the development of new water sources should be developed not only to support the growing population, but also economic activity in growth centers -based on a viable national land-use plan. Extended dry seasons because of climate change would further exacerbate the demand for water, so that new water sources must be developed in a timely manner to ensure domestic water supply. This may adopt ecoefficient[12] measures, including the reuse of excessive rainwater and recycled wastewater for nonhousehold purposes to rationalize water distribution.

Resource regulation shall be strengthened to ensure that surface and ground water supply sources are sustainably developed and utilized. Alternatives should also be identified and prioritized based on a value-engineering perspective, which optimizes options and timing of development to provide value for money and minimize cost to consumers.

4. Localize national policies to support sustainable extension of water services

Since LGUs are on the frontline in the provision of services each local government should be able to develop its own local plans, strategies and corresponding budget allotments, consistent with national policies and targets, including those identified in the PWSSR and the MDG. This should help harmonize and operationalize programs to address existing implementation issues and ensure the sustainable and efficient delivery of water supply to waterless and remote areas.

Sanitation, Sewerage, and Septage Management

Assessment, Issues, and Challenges

Weak Sanitation Governance

Many institutions are armed with sanitation-related mandates, but not one of them takes the lead in pushing for reforms in the sector. Although the DOH plays a key role due to the impacts of poor sanitation on health, only a small unit in the agency is concerned with sanitation. Its role is limited to policy formulation, thereby causing significant gaps between policy implementation and enforcement. In particular there is an inability to deliver commitments made under existing laws. Moreover, the Sanitation Code formulated in 1975 may no longer be appropriate for the requirements of a rapidly urbanizing population, particularly increasing population densities. The said code also does not consider the anticipated complications caused by climate change.

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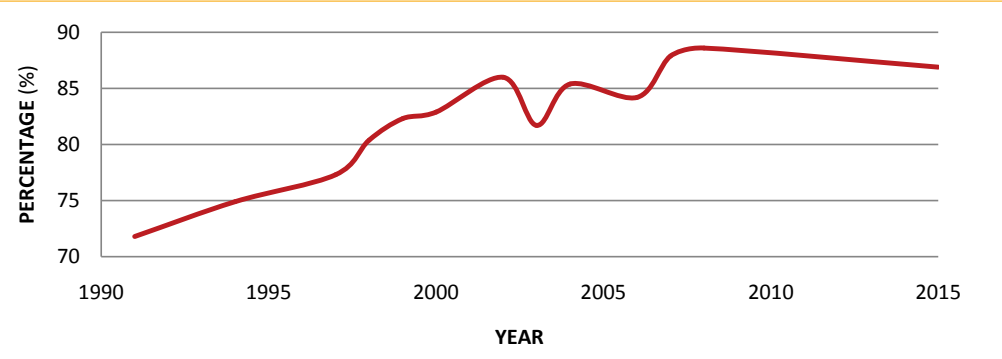
Inequitable Access to Basic Sanitation Facilities and Sewerage and Septage Management Services

As in the water supply subsector, statistics on sanitation are uncoordinated and conflicting. This notwithstanding, WHO/UNICEF JMP on the MDGs show a general trend of improving[13] coverage

[12] Ecoefficiency is having "more value with less impact on the environment"; it emphasizes monitoring of material and energy flows of stocks and life cycle assessment. While eco-efficiency has been successfully integrated in industrial and business processes, its application in water infrastructure development will require the establishment of both physical and non-physical infrastructures (i.e., policies, institutional framework, financing, etc).

[13] For MDG monitoring, an improved sanitation facility is defined as one that hygienically separates human excreta from human contact.

Figure 5.2 Percentage Access to Sanitary Toilets



Source: Philippines Progress Report on the Millennium Development Goals 2010

Table 5.3 Estimated Coverage for Sanitation: 1990-2008

Year	URBAN AREAS (in %)		RURAL AREAS (in %)	
	Improved	Open Defecation	Improved	Open Defecation
1990	70	8	46	23
1995	73	7	52	21
2000	76	6	59	18
2005	78	5	65	15
2008	80	4	69	14

Source: WB/UNDP JMP 2010 Report

The Philippines is on track to meeting its MDG target for sanitation. Data from the DOH and 2010 Progress Report on MDGs, however, show fluctuating year-on-year coverage due to low investment levels, combined with a rapidly increasing population and the increasing frequency of natural disasters that affect the sustained operations of existing facilities.

from 1990 to 2008, with corresponding reductions in open defecation. From a 1990 baseline coverage of about 55 percent, the MDG target is to increase coverage to 84 percent by 2015. The DOH, however, sets a higher national target of 91 percent, with 96 percent for urban areas and 86 percent for rural areas. Similar to access to water supply, access to sanitation is much lower in rural areas compared to urban areas with a visible disparity amongst regions as well.

Based on WHO/UNICEF JMP estimates, the Philippines is on track to meeting its MDG target for sanitation. Data from the DOH and 2010 Progress Report on MDGs, however, show fluctuating year-on-year coverage due to low investment levels, combined with a rapidly increasing population and the increasing frequency of natural disasters that affect the sustained operations of existing facilities.

For sanitation facilities to be sustainable and make an impact on health outcomes, sewerage or septage management support is required. Unfortunately, there have been few investments in proper sewage collection and treatment, especially outside Metro Manila. Less than 10 percent of the population has access to sewerage services. Outside Metro Manila, selected highly urbanized cities (HUCs) provide services to less than 3 percent of their respective area populations (WB 2005). This situation poses major health and environmental problems, especially in HUCs and during or after natural disasters (i.e., at evacuation centers and during rehabilitation of affected areas).

Low Investment and Financing

Despite several national sewerage and sanitation policies like the Sanitation Code of 1975 and the Clean Water Act, demand for sanitation, sewerage and septage facilities, as well as related investments, remain low. Open defecation is still practiced in many areas, especially is highly populated ones, resulting in polluted waterways and the spread of fatal and infectious diseases. Only 3 percent of public investments in water supply are used for sanitation. (PSSR 2010) Investments, by LGUs are limited since few of them have the capacity to implement, operate and maintain these systems. Low investment is also due in part to the low demand, which arose from a lack of popular understanding on the dangers of open defecation and open sewers. Official development assistance (ODA) for sanitation, septage and sewerage is largely administered by DPWH, DENR or MWSS for Metro Manila. Private sector investments are likewise limited because sanitation, sewerage and septage are perceived to be nonrevenue services, with high capital requirements relative to any projected returns. Ideally, these services should be linked to revenue-generating water service provision to facilitate cost recovery. Without a strong regulator for water, sanitation, sewerage and septage management services, there is no imperative or incentive for water service providers to extend the coverage of sewerage services.

Lack of Awareness of the Value of Sanitation and its Services

Most LGUs accord the lowest priority and allot only minimal budgets for sanitation, septage and sewerage services because the benefits are indirect at best. The low demand for sanitation at local levels also extends to wastewater collection and treatment, thus further deferring the development of necessary infrastructure.

Furthermore, research on innovative technologies to provide economically and ecologically efficient sanitation, sewerage and septage facilities is lacking. Technical capacity to plan, implement, operate, and maintain these facilities is also limited both at national and local levels. Capacities to monitor the extent and level of service are likewise limited thereby adversely affecting effective planning and budgeting for the subsector.

Strategic Plan and Focus

To Improve Health Outcomes and Effect a Sustainable Environment through Improved Sanitation, Septage, and Sewerage Provision

The following strategies[14] will be pursued:

1. Develop effective national leadership and sanitation governance

An empowered lead entity at the national level must be established to ensure that sanitation, sewerage and septage targets and plans are met and that critical policies, including the National Sanitation Code, are strictly implemented.

Furthermore, necessary reforms are needed to pull in investments in sanitation, sewerage and septage facilities throughout the country, especially in highly urbanized cities (HUCs). Thus, any amendment or revision to existing national policies should articulate specific

Only 3 percent of public investments in water supply are used for sanitation. Low investment is also due in part to the low demand, which arose from a lack of popular understanding on the dangers of open defecation and open sewers.Without a strong regulator for water, sanitation, sewerage and septage management services, there is no imperative or incentive for water service providers to extend the coverage of sewerage services.

Most LGUs accord the lowest priority and allot only minimal budgets for sanitation, septage and sewerage services because the benefits are indirect at best.

[14] The strategies herein identified are consistent with the Philippine Sustainable Sanitation Roadmap (PSSR), Similar to the PWSSR, the PSSR was developed and subscribed to by the different national government agencies, along with other stakeholders. It presents the plan and guide with long-term development outcomes supported by medium-term strategies and annual operational plans to be able to "provide safe and adequate sustainable sanitation for all and ensuring a clean and healthy Philippines."

national targets and detailed strategies that can eliminate open defecation as well as facilitate local planning and budgeting for expansion of coverage, among others. This could be accompanied by legislative action, if required.

2. Develop a regulatory framework

A single, independent economic regulator for water supply, sewerage and septage management should be established to ensure the following: (a) accountability of service-providers to their customers; (b) sustainability of facilities through improved tariff methodologies; and (c) increased coverage through the provision of incentives and impetus for expansion of services within their areas. (See also strategies for water supply).

3. Rationalize investments and financing to provide infrastructure in strategic areas.

Because of the high capital requirements of sewerage and septage management projects, government intervention is needed to support the private sector in increasing service (septage and sewerage) coverage. Thus, a financing framework should be developed to support sustainably the expected increase in demand for sanitation, septage and sewerage. Alternative PPP packages may be considered, among others.

In the light of current constraints, it is necessary to be deliberate, especially in the implementation of septage and sewerage programs and projects including the development of septage/sewerage treatment plants. Highly vulnerable areas such as HUCs, which are population-dense and susceptible to sanitation problems, should be prioritized. However, it would also be advantageous to include priority tourism spots given their potential for economic development.

The PSSR requires the formulation of programs by other key NGAs and LGUs to support the achievement of the envisioned outcomes. This includes the incorporation of sanitation measures in the design of significant infrastructure, such as school buildings and housing structures.

4. Mainstream sanitation in emergency/disaster response

Water-induced or related calamities resulting from climate change increase the vulnerability of communities that lack proper sanitation facilities. Hygiene promotion, coupled with sanitation response measures, should be mainstreamed in disaster relief and rehabilitation efforts.

5. Improve service delivery through vigorous communication

To increase the effectiveness of national policies, a comprehensive and vigorous communication strategy must be undertaken to educate the public and decision-makers and increase demand for these services. Information, education, and communication (IEC) campaigns among others, are to be developed. This includes dissemination of information on sanitation technology options and standards among LGUs and service providers. These campaigns aim to change behaviors towards proper hygiene in order to increase utilization of household sanitation infrastructure, such as sanitary latrines and septage collection tanks. Development planners and managers should also be provided similar IEC materials with added information on wastewater treatment and disposal methodologies.

Irrigation

Assessment, Issues and Challenges

Inadequate Provision of Irrigation

Irrigation plays a vital role in the development of agriculture as well as in the attainment of food sufficiency. As of the end of 2009, irrigated agriculture comprised about 1.54 million hectares of land or about 49 percent of the estimated irrigable area of 3.126 million hectares. Around 765,000 hectares are served by national irrigation systems (NISs), while communal irrigation systems (CISs) and private irrigation systems (PISs) serve around 558,000 and 217,000 hectares, respectively. According to the National Irrigation Authority (NIA), it spent about PhP119 billion from 1983 to 2009, representing around 78 percent of its total approved appropriations for the same period. Despite this, only less than half of the total potential productive areas have been irrigated (see Table 5.4).

While over 1.6 million hectares remain undeveloped for agriculture, these same areas are threatened by ongoing changes in land use (e.g., conversion into housing developments, golf courses, etc.). It is unclear whether such conversions are warranted by real long-term development trends or these are merely responses to the artificially repressed state of agriculture and the protractedly unsettled status of property rights in agricultural land. Therefore, it may be a prudent course to protect productive land from rapid and irreversible conversions to nonagricultural uses.

Unsustainable Use of Irrigation Water

Because irrigation is the largest use of water in the country, a primary concern

Irrigation plays a vital role in the development of agriculture as well as in the attainment of food sufficiency.

Irrigation is the largest use of water in the country, a primary concern should be to optimize the productive use of water in irrigated agriculture to attain its full benefits and minimize waste.

Table 5.4 Status of Irrigation Development as of 31 December 2009

Region	Estimated Total Irrigable Area (ha)	Service Area (ha)				Irrigation Dev't (%)	Remaining Potential Area to be Developed (ha)
		National Irrigation System	Communal Irrigation System	Private Irrigation System	Total		
CAR	99,650	22,622	35,351	22,912	80,885	81	18,765
1	277,180	57,567	96,654	27,329	181,550	65	95,630
2	472,640	142,530	41,775	23,095	207,400	44	265,240
3	498,860	202,311	78,008	20,555	300,874	60	197,986
4	246,960	53,146	53,133	17,962	124,241	50	122,719
5	239,660	20,530	70,050	29,484	120,064	50	119,596
6	197,250	53,191	20,372	5,499	79,062	40	118,188
7	50,740	10,040	22,529	2,539	35,108	69	15,632
8	84,380	19,104	29,748	4,466	53,318	63	31,062
9	76,080	15,162	19,739	1,972	36,873	48	39,207
10	120,700	26,419	23,564	14,764	64,747	54	55,953
11	149,610	33,971	15,639	25,915	75,525	50	74,085
12	293,610	62,437	22,255	17,296	101,988	35	191,622
ARMM	156,720	16,520	7,095	225	23,840	15	133,440
CARAGA	162,300	29,427	21,719	3,316	54,462	34	107,838
TOTAL	3,126,340	764,977	557,631	217,329	1,539,937	49	1,586,963

Source: NIA as of June 2010

The performance of most of the NISs and CISs has remained poor. Causes include inadequate O&M, lack of routine repair and ineffective management of available irrigation water sources due to financial, technical and institutional deficiencies.

should be to optimize the productive use of water in irrigated agriculture to attain its full benefits and minimize waste. There is currently no incentive to conserve irrigation water, although payments are made on a per-hectare basis regardless of the actual water consumption needs of the crops. Subsidies disguise the true cost of providing irrigation services. In order to promote conservation and the sustainable use, treating water as an economic good provides the basis for putting into place mechanisms that capture its economic value, since water is a finite and limited resource with competing uses and users.

NIA's Delicate System and Financial Performance

NIA's operation has rarely been profitable as the agency's operating expenses far exceed its operating income. In order to improve the agency's fiscal position, strategies to increase collection efficiency of irrigation service fees (ISFs)[15] were implemented, particularly instituting incentive policies on ISF back-account collections. The net effect of such schemes resulted in a steady increase in NIA's corporate income, and although the agency still runs annual net deficits (cash and noncash expenses), the deficits decreased from PhP648 million in 2000 to only PhP24 million in 2009.

With respect to the agency's organizational restructuring, the DBM-approved Rationalization Plan is in its third year of implementation (part of a five-year phased implementation period). This saw the gradual turnover of operation and maintenance (O&M) activities, partially or wholly, from NIA to irrigators' associations (IAs). Despite significant achievements over the years, NIA still has to maintain momentum in order to achieve the sustainable fiscal stability needed to perform its mandate.

Weak Performance of Irrigation Systems

The performance of most of the NISs and CISs has remained poor. Causes include inadequate O&M, lack of routine repair and ineffective management of available irrigation water sources due to financial, technical and institutional deficiencies. Irrigated cropping intensity of NISs nationwide averaged far less than the 200-percent target applied in project preparation. In addition, most of the service areas are dysfunctional and badly need rehabilitation.

Strategic Plan and Focus

To Provide Basic Support Services and Infrastructure as well as Critical Governance Reforms in Shaping a Sector Responsive to the Challenge of Ensuring Food Security for Filipinos across Generations

The following strategies will be pursued:

1. Rehabilitate existing irrigation systems and construct new small-scale systems

Support services and infrastructure shall be geared towards the rehabilitation, repair and maintenance of existing irrigations systems. A rationalized fund mechanism should be implemented, specifically for the immediate rehabilitation of damaged irrigation facilities and systems, over and above the allocation intended for regular maintenance activities. Funding mechanisms envisioned shall include a National Irrigation Management Fund (NIMF), a Communal Irrigation

[15] ISF is a means to generate revenues to cover operations and maintenance (O&M) costs. Personnel costs account for around 80 percent of NIA's operating expenses. Substantial staff resources (up to 40 percent of field staff time) are spent on collecting ISF from individual farmers.

Development Fund (CIDF) and a Patubigayan Trust Fund (PTF). These shall serve as repositories of irrigation funds intended for repair, rehabilitation and improvement as well as extended financial assistance to the irrigation sector. For immediate rehabilitation works resulting from disasters, calamity funds as a part of NIA's appropriations may also be considered for national systems.

Construction of new infrastructure shall focus on small-scale irrigation and water impounding systems (except multipurpose systems) based on a viable national land use plan. These systems are easier to implement and are more cost-efficient than large irrigation systems (except multipurpose systems). The determination of locations for new irrigation systems also factor in CCA and DRRM considerations.

2. Protect irrigated and potential irrigable lands

With the government's thrust to ensure food sufficiency as well as the recognition of the alarming rate of depletion of irrigable lands due to conversion, a review of government policies protecting productive land shall be undertaken. To complement such initiative and to clearly identify gaps, land-use mapping indicating the extent of irrigable areas vis-à-vis irrigated areas is required. (Cross reference with Agriculture Chapter.)

3. Develop a volume-based pricing mechanism

As part of a long-term strategy to ensure its efficient use, wholesaling of water at the resource at the headgate to IAs is expected to drastically cut down collection expenses. This would entail IAs paying only a single fee, with the IAs taking responsibility for collecting ISF from its members. Volumetric (volume-based) pricing at the headgate enhances accountability, since it provides: (a) greater contract assurances for service delivery by the water supplier/s to the IAs ;and (b) incentive to properly maintain the distribution system, improve the equity of head- and tail-end distribution and conserve water resources. Pilot-testing of volumetric pricing has revealed constraints to implementation for open canals, as such, therefore, this will initially be introduced in NISs where secondary irrigation facilities or its components have been fully turned over to IAs through the IMT program. In the interim, NIA may adopt and improve socially-acceptable demand-management strategies.

4. Implement irrigation management transfer (IMT)

IMT aims to transfer to IAs the complete O&M responsibility on secondary canals and on-farm structures in larger systems, and of entire systems covering more than 3,000 hectares. Under such a scheme, it is estimated that the NIA will be left to manage less than 10 percent of the total NIS area, which should substantially reduce the subsidies/operational costs extended by the government. IMT facilitates stakeholder participation in decision-making and planning, provides better access to services and training for its members, produces some income from ISF shares and ensures the equitability of irrigation water delivery and distribution, among others.

Flood and Drainage Management

Assessment, Issues, and Challenges

Inadequate disaster mitigation and response

The country devotes a substantial portion of its resources in the recovery efforts from the effects of flooding. The cumulative impact of floods on the loss of lives and damage to properties and livelihood (see Table 5.5) results in a deceleration, if not a setback, of social progress and economic activity in affected areas.

The country devotes a substantial portion of its resources in the recovery efforts from the effects of flooding. The cumulative impact of floods on the loss of lives and damage to properties and livelihood results in a deceleration, if not a setback, of social progress and economic activity in affected areas.

Table 5.5 Flood-related Impacts: 1980-2005

Year	Casualties**			Damage Value* (PhP M)
	Dead	Missing	Injured	
1980	36	4	55	1,472
1981	484	264	1,922	1,273
1982	337	223	347	1,754
1983	126	168	28	523
1984	1,979	4,426	732	416
1985	211	300	17	3
1986	171	43	155	1,838
1987	1,020	213	1,455	8,763
1988	429	195	468	8,675
1989	382	89	1,088	4,494
1990	676	262	1,392	11,713
1991	5,201	4,278	357	74
1992	145	95	51	7,359
1993	814	214	1,637	25,038
1994	266	54	260	3,401
1995	1,255	669	3,027	57,781
1996	124	49	97	10,109
1997	199	28	66	4,842
1998	498	116	873	17,823
1999	56	3	25	1,555
2000	338	59	370	7,217
2001	431	134	418	6,924
2002	169	33	71	829
2003	139	28	182	4,567
2004**	1,046	437	836	7,679
2005**	62	36	51	2,487
Total	16,594	12,420	15,980	198,609

Source: Flood Risk Management Project Along Selected Principal Rivers, Implementation Program, DPWH, September 2010
**Total damages in infrastructure, agriculture and private property in million pesos.*
***Department of Social Welfare and Development (DSWD) data.*

Furthermore, the country's archipelagic character, with many small islands, makes it highly vulnerable to the effects of climate change. Climate data for the past 50 years shows rising temperatures trends, changing changes in rainfall patterns, and an increasing number of extreme climate events like cyclones, flooding, and drought. (Philippine Strategy on Climate Change Adaptation 2010)

Recent events like typhoons Ondoy and Pepeng in 2009 which resulted in massive damage to lives and properties were wrought by unpredictable weather patterns resulting from climate change. Existing flood control structures in identified high-risk areas nationwide have proved inadequate in handling the unexpected increase in stormwater discharge, which often results in massive flooding both in HUCs and rural areas.

Lack of Financing

DPWH has identified several critical flood control projects nationwide which, owing to insufficient funds, cannot be immediately implemented. This perennial funding problem not only affects the implementation of the hard infrastructure component of projects, but also affects the inherent activities such as the relocation of informal settlers and the acquisition of ROW. This also affects the implementation of complementary nonstructural measures such as flood forecasting, warning, and monitoring systems, evacuation plan, hazard mapping and watershed management activities. Additionally, O&M spending that depends heavily on government allocation are not exempt from funding constraints.

LGUs and other implementing agencies also lack funds for regular O&M of existing flood control programs. Since flood structures are exposed annually to the brunt of typhoons, regular maintenance works have to be carried out to maintain optimal capacities of said structures.

Unsustainable Operations and Maintenance of Structural and Nonstructural Infrastructures

Coordination among government agencies and LGUs is a problem that affects the implementation, operation and maintenance of flood control structures. Once completed, flood control structures should ideally be managed and maintained by the LGUs, and for the case of Metro Manila, MMDA, who have territorial jurisdiction over the project, since these directly benefit from them. However, owing to inadequate financial support and capacity to conduct O&M, not all LGUs and even MMDA can fully commit to this responsibility. The actual mandate for O&M also remains unclear since no law or guideline exists that lays down the sharing of responsibility between the LGUs and government agencies.

Strategic Plan and Focus

To Reduce Adverse Effects of Flooding Occurrences by Maintaining Watersheds and Providing Efficient and Adequate Infrastructure

The following strategies will be pursued:

1. Prioritize the construction of flood management structures in highly vulnerable areas

Available financing for disaster risk reduction and management of infrastructure in the event of floods must be optimized. This involves the development of hazard maps so that vulnerable areas with high population concentrations and important economic and agricultural activities can be prioritized in the provision of flood management infrastructure.

2. Apply CCA and DRRM strategies in the planning and design of flood management structures

Recognizing the effects of climate change on the frequency of storms and rainfall intensity, design criteria for flood control structures should be revisited to ensure that capacities of structures are adequate to handle the expected increase in floodwater volume. Protocols on dam-water release during typhoons should also be reviewed. Moreover, downstream interventions will have to be complemented by upstream activities such as watershed management to minimize siltation which significantly reduces effectiveness of flood control structures, especially when left unabated.

The adoption and mainstreaming of the eco-efficiency concept in water infrastructure is an example of such an adaptation strategy. Excess water during rainy seasons can be impounded, stored and then released for future use in sectors such as irrigation and water supply.

Equally important are immediate post-disaster response and interventions. LGUs and implementing agencies alike are encouraged to adopt a proactive approach in the conduct of DRRM. Emphasis shall be given to preventive measures and structures as well as in raising disaster-preparedness among stakeholders to minimize damage to lives and properties should a natural disaster occur. Furthermore, nonstructural measures such as flood forecasting and warning systems as well as LGU preparedness plans, should be developed accordingly.

3. Develop a mechanism to expedite immediate financing for the rehabilitation of flood management structures

A hindrance to prompt response is the slow disbursement of funding to implement immediate measures. To expedite the process, it may be prudent to provide annual appropriations within DPWH's budget. Likewise, DPWH and affected LGUs may opt to avail of various financing mechanisms and instruments designed especially for post-disaster rehabilitation and repair work.

4. Increase local government and community participation

Since flood-related risks and damages are the immediate concern of local communities, their cooperation and participation in O&M of flood management structures and measures as well as disaster response should be enhanced. Programs should incorporate the participation of stakeholders and the identification of their corresponding roles in watershed protection, flood mitigation and disaster preparedness and response measures. With advocacy and capacity-building assistance from the DILG, LGUs are expected at the forefront of implementing localized CCA and DRRM plans. The government would be required to appropriate the resources needed for both manpower and funding to facilitate smoother operationalization. Financing frameworks should also be developed to provide for the necessary capacity development programs as well as O&M activities of flood control structures and facilities.

Finally, the responsibilities among stakeholders should be clearly defined to promote greater coordination among implementing agencies and LGUs, particularly during the implementation and O&M phases of flood control projects, and to enhance accountabilities.

Energy

Assessment, Issues, and Challenges

On Energy Security

As of December 2009, the country's installed capacity stood at 15,610 MW.

The Mindanao grid is heavily dependent on hydroelectric power plants.

Total primary energy supply (TPES) in 2009 reached 39.6 million tons of oil equivalent (MTOE), with the production of indigenous energy (oil, coal, natural gas, geothermal, hydro, wind, solar, biomass, coco-methyl ester [CME] and ethanol) increasing by 2.0 percent from levels of 2008. The country's self-sufficiency[16] level thus increased from 56.7 percent in 2008 to 59.2 percent in 2009. For 2009, oil accounted for the biggest share of 34.0 percent in the energy supply mix, followed by geothermal energy with its share of 22.4 percent. Coal contributed 15.3 percent, while biomass added 13.59 percent. The remaining shares in TPES were divided between natural gas, hydro, wind, ethanol and CME.

On the demand side, total final energy consumption (TFEC) will grow to 24.9 MTOE by 2013 and 27.7 MTOE by the end of 2016 from the 2009 demand level of 23.6 MTOE. TFEC for the period 2009-2016 is expected to grow annually at 2.3 percent on average.

The transport sector accounts for the highest share of the total demand, with an average of 36.5 percent in 2009, while the industry sector is projected to grow the fastest at an annual average growth rate (AAGR) of 5.1 percent as reflected in Table 5.6.

Power Generation

As of December 2009, the country's installed capacity stood at 15,610 megawatts (MW). Fossil-fuel power plants, mostly located in the Luzon grid, are still the dominant source. The Mindanao grid is heavily dependent on hydroelectric power plants. Coal-fired power plants contributed 27.40 percent, followed by oil-based ones with 20.46 percent and those on natural gas, 18.14 percent. The installed capacity from renewable energy increased slightly with an additional 8 MW expansion of Northwind Power Phase II in Bangui, Ilocos Norte, which became operational in September 2008; the 2.5 MW Sevilla minihydro in Bohol commissioned in November 2008; and the two biomass plants in Negros Occidental with an aggregate capacity of 29.3 MW. Total

[16] Self-sufficiency level refers to the use of indigenous energy composed of oil, coal, natural gas, geothermal, hydro, wind, solar, biomass, Coco-Methyl Ester (CME) and ethanol

Figure 5.3 Primary Energy Mix: 2009

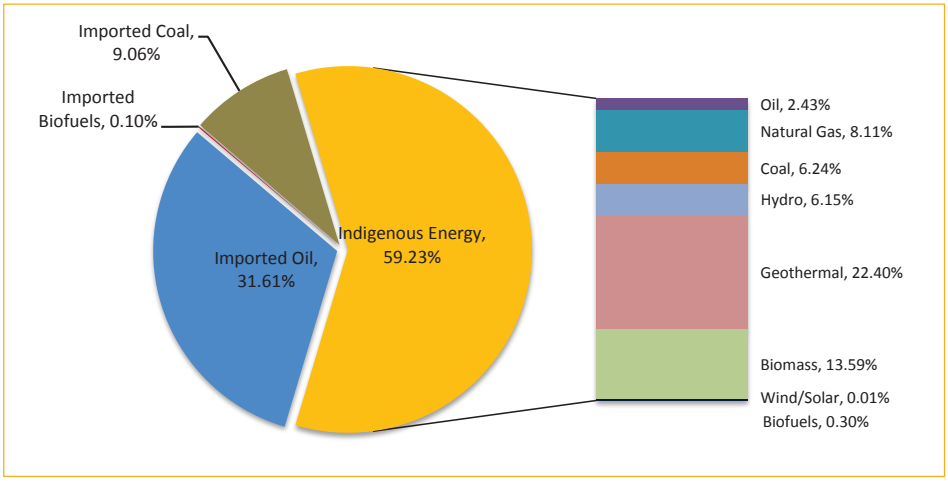


Table 5.6 Projected Final Energy Consumption: 2009-2016

Sector	2009-2016 (%)	AAGR (%)
Transport	36.5	2.1
Industry	28.1	5.1
Residential	24.1	-0.2
Commercial	9.7	1.4
Agriculture, fishery and forestry (AFF)	1.6	3.4

The country's total demand for petroleum products in 2009 rose 6 percent from 101,199 million barrels (MB) in 2008 to 107,299 MB, with diesel accounting for the largest share with 40.7 percent of demand mix.

The transport sector accounts for the highest share of the total demand, with an average of 36.5 percent in 2009, while the industry sector is projected to grow the fastest at an annual average growth rate of 5.1 percent

dependable capacity of the entire grid was at 13,319 MW, or 85.32 percent of the total installed capacity.

Gross power generation in 2009 reached 61,934 gigawatt-hours (GWh), 1.83 percent higher than 2008 level of 60,821 GWh[17]. Natural gas-fired power plants remain the top producer of electricity, accounting for 32.11 percent of the country's total gross generation. Coal-fired plants are second, with 26.60 percent share of the mix. Oil-based generation only accounted for 8.69 percent of the total gross generation in 2009.

In mid-2010, the country was again hit by several hours of rotating brown-outs because of a power supply shortage equivalent to 185 MW. The supply deficit was due to the decrease in dependable capacities of hydro plants caused by El Niño and preventive maintenance schedule of some power plants.

Petroleum products

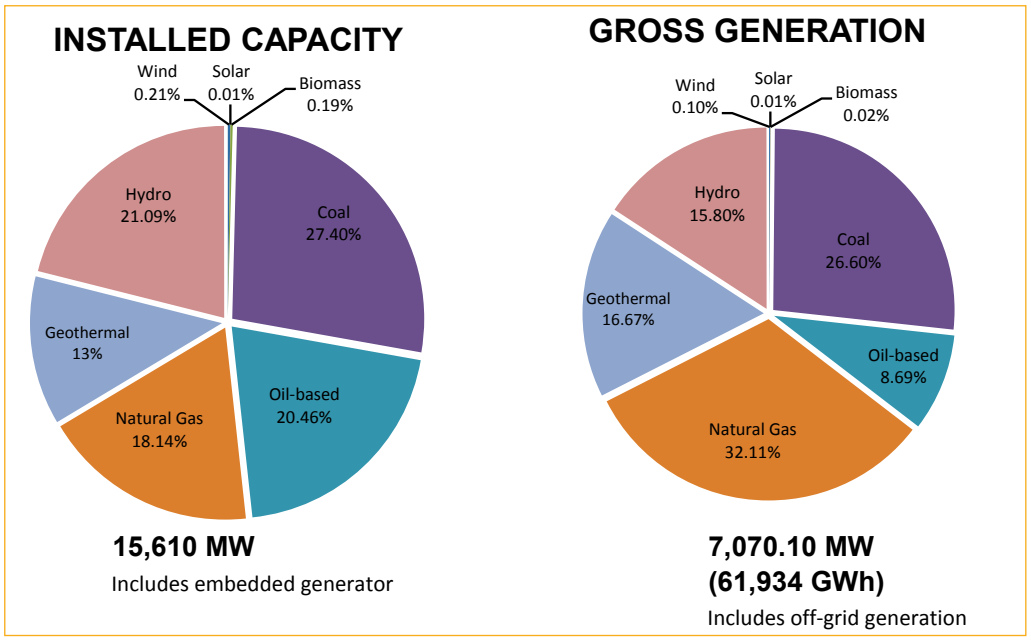
The country's total demand for petroleum products in 2009 rose 6 percent from 101,199 million barrels (MB) in 2008 to 107,299 MB, with diesel accounting for the largest share with 40.7 percent of demand mix. The transport sector is the highest petroleum product consumer followed by industry, as shown in Figure 5.6. To lessen the dependence on imported petroleum products, government has been continuously promoting the development and utilization of alternative fuels.

Alternative Fuels

Biofuels Program. As of the first half 2010, the DOE had accredited 14 biofuel producers (12 for biodiesel and 2 for bioethanol). The

[17] GWh converted in MW is multiplied by the following factor: (1000)*(1/24)*(1/365)

Figure 5.4 Philippine Capacity and Gross Generation: 2009



12 biodiesel producers have a combined production capacity of 395.6 million liters per year. The total sales of biodiesel (CME) blend was 130.9 million liters in 2009 and 54.2 million liters in 2010. Actual diesel fuel displacement from biodiesel in 2009 translates to an equivalent foreign exchange savings of US$34.9 million.

On the other hand, Leyte Agri Corporation, the country's first ethanol facility, and San Carlos Bioenergy Inc., Southeast Asia's first dedicated ethanol distillery with an integrated co-generation power plant, have a combined production capacity of around 49 million liters of ethanol annually. Both plants together sold 23.1 million liters in 2009, equivalent to foreign exchange savings of US$10.1 million from gasoline displacement. In the first half of 2010, 9.2 million liters of ethanol were sold to oil companies. By end-2010, Roxol Bioenergy's ethanol plant would have provided an additional capacity of 30 million liters per year, bringing total annual ethanol production to about 79 million liters.

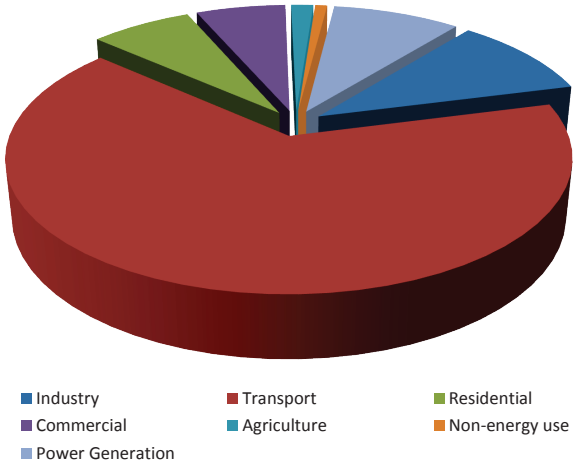
To meet the technical requirements of the program and ensure continuous research and development support, the DOE provided counterpart funding of PhP50 million for the establishment of a vehicle-testing facility located at the Department of Mechanical Engineering Laboratory, UP-Diliman.

Auto-LPG Program. In support of the government's Auto-LPG Program, the Development Bank of the Philippines (DBP) has included the auto-LPG initiative in its "Clean Alternative Transport Fuel Financing Program," which provides reasonable financing packages for auto-LPG related activities such as acquisition of auto-LPG vehicles. The Land Transportation Franchising Regulatory Board (LTFRB) also extended by two years the franchise of taxis that converted to auto-LPG. These schemes promote large-scale conversion of taxi fleets and encourage new player participation in the program.

As of first half of 2010, there were about 18,731 converted vehicles nationwide running on LPG and 217 auto-LPG dispensing stations (72 garage-based). The sales growth of auto-LPG products registered an equivalent reduction of

Figure 5.5 Sectoral Oil Consumption: 2009

SECTOR	CONSUMPTION (KTOE)	% share
Industry	1,359.40	10.17%
Transport	8,749.50	65.45%
Residential	937.6	7.01%
Commercial	826.4	6.18%
Agriculture	204.8	1.53%
Non-energy use	111.6	0.83%
Power Generation	1,177.90	8.81%
TOTAL	**13,367.20**	



CO2 emissions by 214,664 metric tons (MT) and 48,789 MT for 2009 and the first quarter of 2010, respectively. Moreover, the 293 LPG-converted tricycles nationwide have an equivalent reduction of 495,521 kilograms (kg.) of carbon dioxide.

Natural Gas Vehicle Program for Public Transport (NGVPPT). The alternative use of natural gas in the transport sector is being pursued through the NGVPPT. From a minimal volume of CNG utilization in 2007 following the inauguration of the pilot mother and daughter refueling system, the total consumption of natural gas for the transport sector already reached 18.1 Million Standard Cubic Feet (MMSCF) in 2009.

As of first half of 2010, there were 7 accredited bus operators and 34 CNG buses plying the routes of Southern Luzon and Metro Manila. An additional 27 buses are under testing and evaluation. The CNG daughter refueling station operates in Barangay Sto. Tomas, Biñan, Laguna.

To sustain developments in the industry, a joint undertaking with the Polytechnic University of the Philippines (PUP) was initiated to establish the first Natural Gas Institute in the country. The said Institute is envisioned to develop the industry and enhance local capacity to support the emerging natural gas industry and provide the necessary capacity building needs of the industry.

Renewable energy

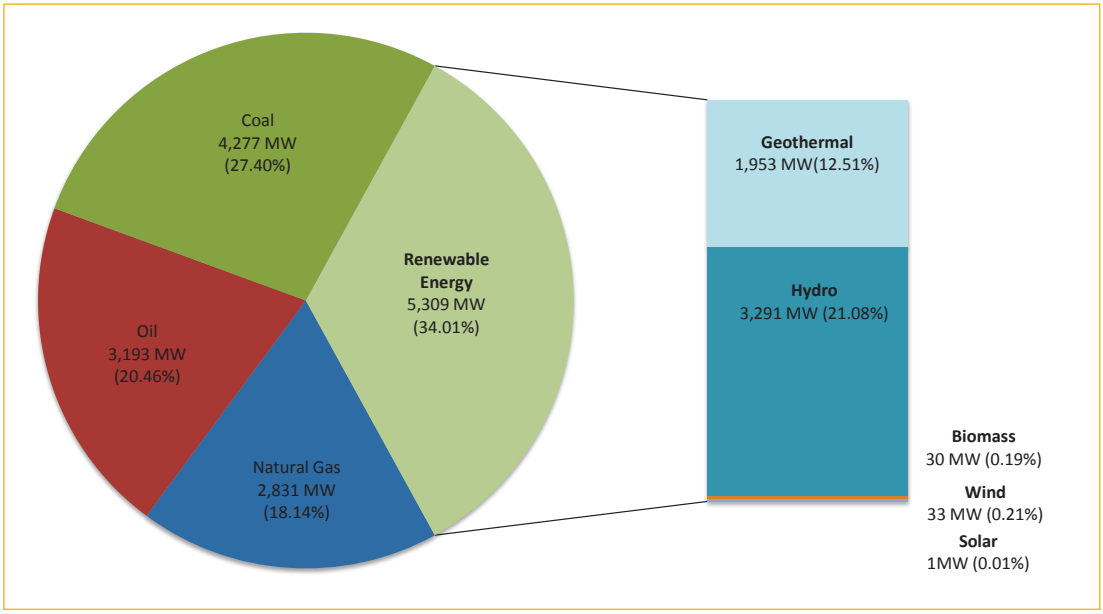
The "Renewable Energy Act of 2008," (RA 9513) sought to accelerate the exploration and development of the country's renewable energy (RE) sources. It also seeks to strengthen the DOE policies on renewable energy programs and expand the provision of fiscal and nonfiscal incentives to encourage private sector investment in the renewable energy industry. The Implementing Rules and Regulations (IRR) was signed on May 25, 2009. Consequently, the National Renewable Energy Board (NREB) was convened pursuant to Section 27 of RA 9513 to promulgate the said law and other related policy and regulatory mechanisms such as the Renewable Portfolio Standard (RPS), Feed-in Tariff (FiT) System and the National Renewable Energy Program (NREP).

As of end-2009, total installed capacity from RE stood at 5,309 MW. Figure 5.6 shows the breakdown of the RE contribution to total power-generating capacity for on-grid areas. Total dependable capacity from RE resources for ongrid areas stood at 4,278 MW.

As of end-2009, total installed capacity from RE stood at 5,309 MW. Total dependable capacity from RE resources for ongrid areas stood at 4,278 MW.

The goal of reducing fossil fuel consumption and promoting the development and utilization of renewable energy remains a major challenge.

Figure 5.6 RE Contribution to Total Power Generating Capacity: 2009



Electricity rates in the Philippines are deemed among the highest in Asia.

RE technologies are relatively expensive for local investors/developers. On the other hand, foreign investments have been slow to take up the slack because of the issue of project ownership, which is by law, stipulates majority Filipino ownership.

The goal of reducing fossil fuel consumption and promoting the development and utilization of renewable energy remains a major challenge. To benefit fully from RA 9513, government must institute certain changes, create new and additional units of infrastructure, and introduce new systems. Among the crosscutting issues raised on renewable energy development during various energy consultations are the following:

a. high cost of RE development due to limited number of local manufacturers, fabricators and suppliers of RE equipment and components which are mainly imported;

b. limited options to optimize the development of resources because of a lack of an up-to-date database on RE resources;

c. lack of capacity-building and training opportunities to enhance technical capabilities of stakeholders and potential developers;

d. need for stronger R&D on RE;

e. limited infrastructure support (i.e., transmission lines and submarine cables);

f. limited information and education campaign activities on RE that includes advocacy on its benefits;

g. absence of direct policy linkages with grassroots groups; and

h. dependence on government initiative and resources for the development of energy projects.

Fossil fuels

Oil and Gas. The country has 16 sedimentary basins with a combined potential of 4,777 million barrels of fuel oil equivalent (MMBFOE) or 689.8 MTOE of oil and gas reserves.

An additional 150 billion cubic feet (BCF) of gas have been recovered from the seventh well of the Malampaya which could fuel a 300 MW natural

gas power plant for a period of 12 years. Existing oil and gas fields yielded an output of 2.92 MMB of oil coming mostly from the Galoc Field, which began producing in October 2008. With two production wells, Galoc Field has an average daily production of 14,000 barrels. Production for the first semester of 2010 was registered at 1.75 MB of oil, 56.51 million standard cubic feet (MMSCF) of gas and 2.16 MB of condensate.

Despite a favorable business experience in the upstream energy sector, the social acceptability of these projects still needs to be addressed.

Coal. The Philippines currently has 13 coal basins with a total resource potential of 2.4 billion metric tons (BMT). Indigenous coal production in 2009 reached 4.7 million metric tons (MMMT or 10,000 BTU/lb), a 29.9 percent increase over the 3.6 MMMT produced in 2008. This is due to the robust output of Semirara Mining Corporation, which contributed 4.36 MMMT or 93.1 percent of the total coal production. As of the first half of 2010, coal production had reached 3.6 MMMT, which was 38.2 percent higher than the coal output during the same period in 2009.

Social acceptability, environmental sustainability, and the country's low-grade coal are challenges that need to be addressed.

On Power

Electricity

Electricity rates in the Philippines are deemed among the highest in Asia. Economic growth has been impeded by an unreliable power supply as indicated in the annual average growth rate of -0.4 percent of electricity to GDP[18] from 1999 to 2009.

Power demand and supply

With peak demand assumed to grow annually at 4.5 percent for the planning period 2009-2030, a total of 11,900 MW is needed for the Luzon grid; 2,150 MW for the Visayas grid; and 2,500 MW for the Mindanao grid.

The liberalized and market-based power industry put in place by EPIRA relies on the private sector to construct generation plants to meet demand. Private sector investments in power generation, however, have been lower than expected vis-a-vis projected energy demand. Moreover, the usual gestation period to build new electric power plants is three to five years.

A total of 11,900 MW is needed for the Luzon grid; 2,150 MW for the Visayas grid; and 2,500 MW for the Mindanao grid.

A 60-percent level in energy independence is conservative given the country's natural resource endowments. Electricity generated from indigenous and renewable energy sources, however, is more expensive despite being accorded priorities in light of their environmentally benign characteristics.

Establishment of the Wholesale Electricity Spot Market (WESM)

The WESM began commercial operations in Luzon on June 26, 2006 to create a competitive electric power industry for better and more efficient electric service at a reasonable cost to consumers. To date, 13 generating companies participate directly in the WESM with 11 distribution utilities (DUs) and five registered direct suppliers. WESM operations in the Visayas region, while hindered by inadequate capacity in both transmission and generation facilities,

[18] Electricity to GDP (watt-hour/Php) is an Intensity Indicator

nonetheless commenced in December 2010. Market rules for Mindanao have yet to be laid down.

Privatization of at least 70 percent of NPC generating assets in Luzon and Visayas.

As of June 2010, the government was able to privatize 26 of its generating or operating plants and four decommissioned assets. 20 of these assets comprise 91.7 percent of PSALM-owned capacities in the Luzon and Visayas, thus surpassing the 70-percent condition for open access and retail competition. The latest successful bid was of the 150-MW Bac-Man geothermal power plant.

As of June 2010, actual privatization proceeds collected by PSALM from the sale of generation and transmission assets has amounted to US$4.42 billion.

Transfer of management and control of at least 70 percent of total energy output of power plants under contract with NPC to Independent Power Producer (IPP) Administrators

The government successfully bid out 3,345.75 MW of NPC-contracted capacities to IPP Administrators, equivalent to US$3.228 billion in proceeds. This amounts to a cumulative 68.22 percent of total capacities privatized, towards the 70 percent required for the start of open access.

Privatization of the National Transmission Corporation (TransCo)

The government on January 15, 2009 formally turned over the 25-year concession of the National Transmission Corporation (TransCo) to the NGCP. The NGCP remitted US$987.5 million to PSALM as its upfront payment for the operation of the transmission system and in compliance with the provisions of the sale transaction. This amount is 25 percent of the US$3.95 billion purchase price paid for the concession contract. This concessionaire of TransCo is in charge of development, upgrading, and rehabilitation of the electricity grid.

Divestment of Transco's subtransmission assets

The sale of TransCo's subtransmission assets involves some 131 sale packages covering 107 interested DUs, mostly electric cooperatives. In cases where more than one DU is connected to a transmission line, the connected and qualified DUs must form a consortium to buy and thereafter operate the asset. These subtransmission assets include about 6,200 circuit kilometers (ckt) comprising mostly 69kV transmission lines and 1,600 MVA of substation capacity. The cost of these assets is placed at about PhP7.6 billion (based on December 31, 2007 net book values).

As of October 31, 2010, TransCo had divested itself of PhP3.55 billion (69 sale packages) worth of subtransmission assets including 325 MVA transformers in favor of 57 DUs. Included in the sale packages are 40 Lease Purchase Agreements with 32 cooperatives under concessional terms amounting to about PhP2.4 billion. The balance of over PhP1.150 billion represents sales to private distribution utilities. Thirty-three sale contracts have been approved by the ERC amounting to PhP1.75 billion as of October 31, 2010.

Use of privatization proceeds to reduce borrowings

As of June 2010, actual privatization proceeds collected by PSALM from the sale of generation and transmission assets has amounted to US$4.42 billion. This includes other privatization-related fees such as lease rental, assignment of ROW, purchase price for land, and forfeiture of bonds.

The proceeds from the sale of National Power assets are used to service the financial obligations of

National Power (e.g., prepayments of maturing debts, regular National Power debt servicing, servicing of IPP obligations).Of the privatization proceeds collected so far, PSALM has utilized US$4.089 billion for the following (as of June 30, 2010):

Prepayments	US$1.297 billion
Regular NPC Debt Servicing	US$1.600 billion
Servicing of IPP Obligations	US$1.095 billion
Privatization Related Expenses	US$0.097 billion
Total	US$4.089 billion

Condonation of loans

The national government, through PSALM, condoned the loans of electric cooperatives (ECs) used for electrification purposes amounting to PhP18.1 billion. This resulted in a reduction in ECs' rates in the range of PhP0.0578/KWh to PhP1.3507/KWh. As of October 31, 2010, the government through PSALM had paid a total of PhP10.696 billion worth of financial obligations to LGUs and other government agencies.

Mandatory Rate Reduction

From January to March 2010, NPC granted a total of PhP358.1 million for the Mandatory Rate Reduction (MRR), in which the Luzon residential customers accounted for 27 percent. Residential customers of the Manila Electric Company (Meralco) account for 20 percent. From 2001 to March 2010, NPC has already spent a total cost PhP25.65 billion for the grant of MRR.

Regulation

As stipulated in the EPIRA, members of the Energy Regulatory Commission (ERC) are appointed by political authorities. This arrangement, however, has brought up issues of transparency and independence. The previous Plan (2004-2010) already contained a planned reassessment of the ERC's performance and processes, suggesting the creation of an independent search committee as a mechanism for ERC appointments. To date, no such assessment and evaluation of the ERC has been conducted. An independent monitor of the regulatory setup of the sector is necessary as part of a system of checks and balances, especially once the generation and transmission sectors are privatized.

On Electrification

Electric Cooperatives are private entities but receive sizeable government subsidies. Some provisions of the Magna Carta for Residential Electricity Consumers have weakened the implementation of the Anti-Pilferage Law, leading to an increase in system losses and inefficiencies among ECs. An example is Article 19 of the Magna Carta, giving the consumer the right to tender payment at the point of disconnection or provide a deposit representing the differential billing. Article 20, moreover, obliges the utility to continue providing service despite arrears of previous occupants of a building/dwelling place. Parts of Articles 16-25 give the consumer a reprieve from disconnection during holidays, funerals, or if the consumer is sick.

As of December 2010, the ERC has been in the final stages of amending both the Magna Carta for Residential Electricity Consumers and the IRR of the Anti-Pilferage Act. Earlier in 2009, the ERC had issued the Rules to reduce systems losses of ECs from 14 percent to 13 percent, and of private distribution

The delay in implementation was due to limited funds, ROW problems for transmission and substation projects, deferment of T/L and S/S projects since NPPs preferred distributed generation, and failed biddings for the purchase of equipment.

utilities (PDUs) from 9.5 percent to 8.5 percent. The Rules for Setting EC Wheeling Rates (RSEC-WR) were issued to encourage efficiency and provide incentives for the ECs performance.

Barangays. As of July 31, 2010, 99.87 percent of all barangays were electrified, up from 99.39 percent in 2009 leaving only 54 barangays programmed for electrification until the end of 2010. From January 2009 to July 2010, the ECs provided electricity to 847 rural barangays. The 119 ECs in the country have achieved 99.94 percent energization relative to their respective franchise areas. The Mearlco and private investor-owned utilities (PIOUs), together with LGUs, have 27 and 7 remaining unenergized barangays, respectively.

The Energy Reform Agenda for 2010-2016 is guided by the vision of "Energy access for more".

Accelerate exploration and development contracts through the Philippine Energy Contracting Round

Intensify development and utilization of renewable energy and environment–friendly alternative energy resources/ technologies

Households. As of July 2010, the household connection level in the country had reached 74.0 percent. This means 14.204 million out of a total 17.534 million households[19] have electricity connections.

Missionary areas. Large portions of the remaining unenergized barangays are mostly remote and with dispersed households that are difficult to energize, requiring extensive resources, time and effort. Electrification in some barangays, particularly those covered by solar projects, was found to be short-lived owing to the absence of a strong sustainable mechanism.

Based on the 2009 Missionary Electrification Development Plan (MEDP), the total projected capacity addition for Small Power Utilities Group (SPUG) areas was 26.69 MW, of which only 6.61 MW was added in 2009. For transmission and substation projects, a total of 226.01 km. of 69kV transmission lines and 50-MVA substations were projected. However, only 22.41 km. transmission lines were put up while the rest were in preconstruction stages. Likewise, no substation was put up in 2009. As for remote area electrification, 130 of 133 areas were electrified, an accomplishment of 97.74 percent.

The delay in implementation was due to limited funds, ROW problems for transmission and substation projects, deferment of T/L and S/S projects since NPPs preferred distributed generation, and failed biddings for the purchase of equipment.

The NPC Main Grid is no longer able to advance funds to finance the operations of SPUG, including project implementation, since the main grid plants were already sold. SPUG's funds come from its revenues and the UCME subsidy. In 2009, the UCME was approved only on the latter part of the year and was used for SPUG's operations and payments for the subsidies of New Power Providers (NPPs).

Of the latest approved UCME equivalent to PhP2.7 billion for each year from 2010-2013, only PhP533 million is allotted for capital spending. This amount is not enough to fund all projects and additional funding is required. SPUG is now looking for other sources of funds.

Under Rule 13 of the EPIRA-IRR, the DOE in coordination with NPC, NEA, NPPs, DUs and QTPs has prepared the MEDP 2011 with two major components, namely, missionary generation and remote area electrification, which includes the barangay and household electrification. This outlines the government's plan to implement policies and programs that will sustain the provision of adequate, reliable, and efficient supply of electricity in missionary or offgrid and remote areas

[19] Total number of households is based on 2000 Census

and to enable these communities to receive the benefits of electrification.

SPUG covers 284 plants in 214 areas, with 14 areas being candidates for privatization. Of these 14 areas, the generation function of two areas was successfully taken over by private parties.

Missionary generation. Missionary generation includes the existing generation and associated delivery systems being managed by SPUG, NPPs and QTPs in small islands and isolated grids. The program involves improving reliability and efficiency through the replacement of old generating units and limiting the rental of units during emergency.

Remote area electrification. Consistent with the overall objective of total barangay electrification and household electrification, all remaining unelectrified barangays in small islands and isolated grids will be provided with electricity service. A total of 1,760 households are programmed for remote area electrification amounting to PhP169.714 million for the different missionary areas.

Strategic Plan and Focus

The Energy Reform Agenda (ERA) for 2010-2016 is guided by the vision of "Energy access for more". Government's key priority is to ensure sustainable, diverse and reliable energy sources through consultation and the participation of multiple stakeholders. Increased economic efficiency in the use and distribution of energy services is critical to achieving energy access for the majority at competitive rates.

The ERA will utilize PPPs to implement critical infrastructure projects of the government that will address the growing energy needs of the country. Through PPPs, the DOE can benefit from the technical and financial support of its partners in the private sector, including businesses, investors, and nongovernment organizations (NGOs). PPPs will cover all phases of energy development and utilization.

To ensure energy security

Accelerate exploration and development contracts through the Philippine Energy Contracting Round (PECR)

First launched in 2006, the PECR shall be continued. Aggressive promotion of indigenous oil and gas resources and coal prospect areas via competitive contracting scheme under the PECR will be pursued.

Through PECR, the oil and gas sector is expected to yield an additional 23 Service Contracts (SCs) and drilling of 35 wells by end of 2016. From 2010 to 2016, production targets for the oil and gas fields are projected at 36.3 MMB of oil, 1,029.5 BCF of gas and 37.8 MMB of condensate. The biggest contribution will be provided by the Malampaya oil and gas fields, which will contribute 23.1 MMB of oil, 1,022 BCF of gas and 37.2 MMB of condensate. New geophysical data will also be acquired to cover a total of 18,550 line/km. and 3,750 sq./km. of 2D and 3D seismic data, respectively, by the end of 2016.

Intensify development and utilization of renewable energy (RE) and environment–friendly alternative energy resources/technologies

RE development is targeted with the government gearing to be the world leader in geothermal energy, the largest producer of wind power, and the solar manufacturing hub in Southeast Asia. In addition, the harnessing of the country's hydropower and biomass energy potentials shall be continued.

The National Renewable Energy Program (NREP), to be drawn by DOE in consultation with other concerned stakeholders, will provide the overall

Increase utilization of alternative fuels.

Implement higher biofuels blend from B2 to B5 to diesel, and E10 to all gasoline and corresponding standards in phases subject to availability of supply.

strategic policy directions in the RE industry.

The government will pursue the research and development of untapped RE available such as ocean thermal energy conversion (OTEC). To date, the country's potential sites for deep-ocean power consist of 910 blocks equivalent to 73,710 hectares. Deep Ocean Power Philippines, Inc. (DOPPI) has already filed its application for OTEC Pre-Development Contract for 36 areas.

Existing RE-based power generation capacities shall be increasingly utilized. From the generation expansion exercises used in the formulation of the country's power development program, out of the 8,156.7 MW of total RE potential, 4,701.96 MW is expected to come in the next 30 years, broken down as follows: (a) hydropower with 2,113.1 MW; (b) geothermal with 1,475 MW; (c) wind with 930 MW; (d) biomass with 112.8 MW; and (e) solar with 71 MW. Of these capacities, around 57 MW is expected in the short term, 130 MW in the mediumterm; around 775 MW is expected to come in between 2014 and 2016. The remaining capacity is expected beyond 2016 and up to 2030. The committed capacities expected to be commercially operated within the short term are: (a) 70 MW from geothermal; (b) 50.5 MW from hydro; and (c) 17.5 MW from biomass.

Harmonization is a critical factor in the exploration and development of geothermal resources, especially those located inside protected areas, hence the need to unify provisions of RA 7586 (National Integrated Protected Areas System [NIPAS] of 1992) and RA 8371 (Indigenous People's Rights Act [IPRA] of 1997), with relevant energy policies and programs for an integrated response to environmental and sociocultural concerns.

Increase utilization of alternative fuels

The government's policies and programs on alternative energy are geared towards reducing the country's dependence on price-volatile oil imports and diversifying from conventional fuels towards indigenous renewable and environment-friendly energy resources. The development of other feedstocks for biodiesel and bioethanol (i.e., jatropha) is also encouraged through research and commercial production. It is important to develop alternative energy sources, especially indigenous and renewable forms, with an end view of providing security of supply as well as realizing savings from importation.

a. Implement higher biofuels blend from B2 to B5 to diesel, and E10 to all gasoline and corresponding standards in phases subject to availability of supply[20]

The National Biofuels Board (NBB) is set to recommend the levels of biofuel blends based on supply availability, price and quality of biodiesel, including blending infrastructure and logistics.

b. Conduct RD for other nonfood feedstock in coordination with concerned agencies, academe & research institutions

The government will broaden the coverage of the Biofuels Program to identify other feedstocks. Techno-economic studies on palm and algae as potential biodiesel feedstocks will be pursued, while cellulosic technologies will be used to produce bioethanol.

The academe and other research institutions, which are among the partners in research and study by the DOE, shall be encouraged to continue their undertakings on nonfood feedstock R&D activities.

Conduct RD for other nonfood feedstock in coordination with concerned agencies, academe & research institutions.

Continuously promote the use of alternative fuels (i.e compressed natural gas, auto liquefied petroleum gas) as well as other emerging energy technologies such as electric vehicles in the transport sector.

[20] B2: 2% bio-diesel (coco-methyl ester [CME]) blend; B5: 5% bio-diesel (CME)blend; E10: 10% bio-ethanol

c. Continuously promote the use of alternative fuels (i.e compressed natural gas, auto liquefied petroleum gas) as well as other emerging energy technologies such as electric vehicles in the transport sector

The promotion of natural gas use in industrial, commercial, residential and agricultural sectors will continue to be encouraged. The conversion of existing and decommissioned power plants to natural gas shall be pursued. Active interaction with the downstream energy sector shall be prioritized through gas-to-market projects. The use of CNG in vehicles will also be encouraged.

Given the benefits of CNG and LPG over fossil fuels, the DOE will also renew its efforts to promote the former in the transport sector. The DOE will facilitate the required policy support as well as the availability of critical supply infrastructure and facilities. The infrastructure of major gas pipeline networks needs to be strengthened and expanded to reach commercial establishments and households.

DOE will work with the 15th Congress for the passage of the Natural Gas Bill. With regard to auto-LPG conversion, the DOE will conduct technology validation for dual fuel jeepneys and other motorized diesel/gas engines and conduct capability building for regulators and implementers to develop available manpower expertise. Studies will be conducted to determine the viability of expanding the use of auto-LPG to other types of engines, together with studies on the necessary safety standards.

Pursue the enactment of a law on energy efficiency and conservation

An Energy Efficiency and Conservation Law is a critical measure to economize the energy requirements of growth. The proposed legislation should incorporate policies and measures to develop local energy auditors and energy managers, develop the ESCO industry, encourage the development of energy-efficient technologies/ buildings and provide incentives for the effective promotion of efficiency initiatives in the energy market sector.

To achieve a reliable and secure supply of electric power

The government shall pursue the following strategies:

1. Diversify the country's power sources, especially in Mindanao, to address the susceptibility of hydro power plants to climate-change impacts;

2. Study alternative technologies in power generation;

3. Assess the vulnerability of energy facilities to climate change and natural disasters (e.g. El Niño and La Niña);

4. Conduct a comparative study of similar or related energy policies in the ASEAN;

5. Focus on demand aggregation and contracting from Electric Cooperatives;

6. Implement the Transmission Development Plan (TDP);

7. Revisit EPIRA and its IRR (e.g. the possibility of recommissioning of power

Pursue the enactment of a law on energy efficiency and conservation

To achieve a reliable and secure supply of electric power.

Achieve 90 percent household connection by 2017

plants under preservation, lifeline rates and cross subsidies among others; and

8. Establish triggers to allow government to build power plants in face of weak private sector interest.

To expand the government's electrification program

The following strategies shall be pursued:

1. Pursue higher household electrification. The government intends to achieve 90 percent household connection by 2017 through the expanded rural electrification program using RE Systems.

2. Rationalize the Universal Charge for Missionary Electrification (UCME) rates approved by ERC in order to cover missionary electrification;

3. Engage LGU support for the missionary areas; and

4. Strengthen LGU capacity in power project development and in accessing available funds (i.e., ER 1–94).

Information And Communications Technology (ICT) Infrastructure

Assessment, Issues, and Challenges

Technological innovations and commercial developments have expanded growth opportunities in the ICT sector, with private sector players continuing to invest in developing the country's ICT infrastructure. The government, for its part, has been promoting the spread of ICT as a means to interconnect the country, even out social opportunities, raise overall living standards and attain global competitiveness.

The growth and dynamism of the ICT sector has accommodated the existence of 7 mobile operators, 73 local-exchange carriers, 14 intercarrier service providers, 11 international gateway facility (IGF) operators, and 471 value-added service (VAS) providers[21]. The availability of ICT services has facilitated development through more efficient and effective delivery of both existing and novel applications in business and commercial transactions, general government, education and health services, among others.

Current State of ICT Deployment and Use

Service Coverage

The scope of ICT technologies and services in the country includes fixed telephone lines, wireless communications, and broadband Internet, among others. Cellular mobile telephone service (CMTS) is by far the dominant telecommunications service in the market, covering 94.7 percent[22] of total municipalities, as compared with 53.9 percent[23] coverage for fixed telephone lines. Despite the continued expansion and success in CMTS, a number of unserved municipalities still exist. Coverage gaps need to be addressed to achieve universal access and service for telephony.

Meanwhile, the country's fiber-based backbone network provides for

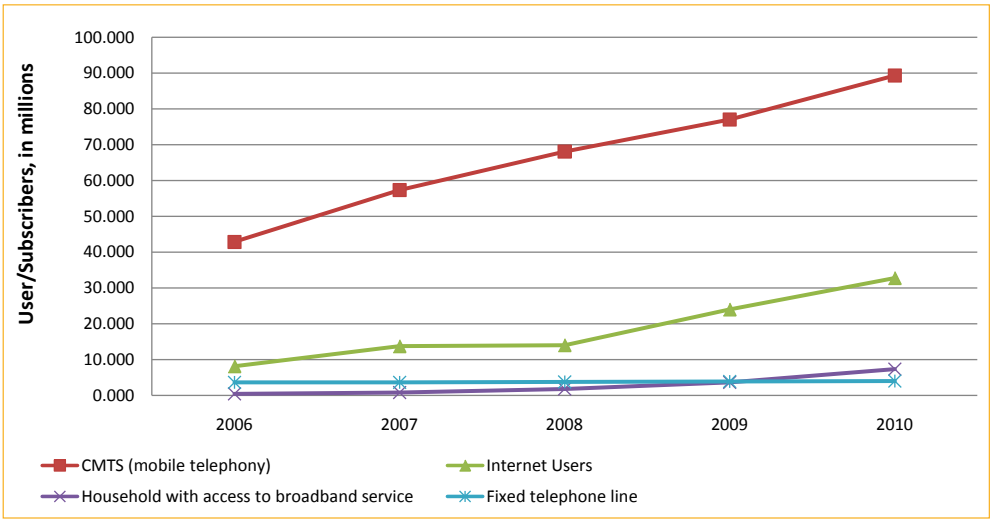
[21] Source: National Telecommunications Commission (NTC), figures as of end of 2009

[22] Source: COMELEC data, used as of last 2010 Automated Election, where 5.26 percent of municipalities were identified to have not been covered by any mobile network service. It should be noted however that CMTS coverage in some municipalities may only be referring to the town centers, with remote barangays and schools of such municipalities still having no connection yet.

[23] Source: NTC, 2009

[24] Source: CICT

Figure 5.7. Growth in Number of Users/Subscribers of Major ICT Services: 2006-2010



Source: CICT, NTC

domestic and international broadband connectivity with about 63 provinces (79%) in the country having fiber-based infrastructure. Further, at least 761 cities and municipalities (about 50%) are considered to be covered with fixed or mobile broadband Internet services.[24] However, the presence and geographic reach of mobile broadband (usually 3G wireless technology) in said areas is still very limited and only covers urban centers and boundaries.

ICT Penetration (Access and Subscription)

The increase in the number of CMTS subscribers has been phenomenal, especially as the short messaging service (SMS) or more popularly known in the country as "text messaging," has become a way of life for many Filipinos. Over two billion text messages (sending and receiving) are being handled daily by cellular mobile operators. More advanced services are also becoming prevalent, such as the multimedia messaging service (MMS) and the third generation (3G) mobile communication technology, which were rolled out in 2004 and 2006. The greater challenge, however, is for Internet, particularly broadband access and subscription, to also catch up and achieve the same level of service with that of mobile telephony, be it through wired (e.g., Digital Subscriber Line connection) or wireless broadband access (e.g., 3G/ High Speed Packet Access technology). Figure 5.7 shows signs of market concentration in the sector with the continuous growth in mobile telephony services, leaving other forms of ICTs such as Internet and broadband access far behind.

In terms of Internet connection speed, a recent global broadband speed analysis test shows that the Philippines' average download speed (i.e, the speed at which data is sent from the Internet to your computer) is at 2.34 megabits per second (Mbps), while the average upload speed (i.e., the speed at which data is sent from your computer to the Internet) is at 0.65Mpbs.[25] This ranks the Philippines at 72nd in worldwide download speed and 65th in worldwide upload speed.

Based on the concept of shared facility, the national government, in collaboration with LGUs has established the Philippine Community e-Center Program, which to date has successfully connected over 1,200 communities to the Internet.

[25] Source: Speedtest.net, 200

At present, penetration of personal computers (PC) in the country is still considered low, especially in rural areas, which may be attributable to infrastructure limitations, availability of electricity access, and cost of ownership or household financial constraints. Since many Filipinos still do not own PCs, other alternative places such as Internet cafes, WiFi hotspots, offices, and schools, among others, serve as common Internet access points. There are currently some 30,000 to 40,000 registered Internet cafes and an estimate of 2,000 WiFi hotspots throughout the country. The increase in number of Internet cafes and the availability of free WiFi access in public spaces has led to competition and cheaper rates. Although PC ownership levels are quite low, utilization rates are much higher considering that the country's social networking penetration rate is at 83.1 percent, which is higher than the global average of 57.5 percent.[26]

The use of shared access facilities has also helped increase Internet usage, and made access to Internet services more affordable, especially in poor and underserved communities. Based on the concept of shared facility, the national government, in collaboration with LGUs has established the Philippine Community e-Center (CeC) Program, which to date has successfully connected over 1,200 communities to the Internet. The CeCs also serve as common access points for e-Government services.

Internet Connection in Public High Schools

As of 2009, only 29 percent of the country's public high schools had an Internet connection. Table 5.8 shows that the least number of connected public high schools are in the Cordillera (CAR), Cagayan Valley (Region II) and Bicol (Region V) regions. This can be largely attributed to budgetary constraints or the high cost of setting up infrastructure, especially over difficult terrain or geographical locations. Many unconnected public high schools are also located in areas not served by private telecommunications companies (telcos), which could indicate the digital divide between urban and rural areas across regions.

Broadcast Communications

As of end 2009, the broadcast sector comprised 306 television (TV) stations, 905 cable television (CATV) operators, 386 AM stations, 676 FM stations, and 5 direct-to-user (DTU) satellite providers.

At present, the transition from the traditional analogue to digital television broadcasting is already progressing in many developed nations, or is otherwise being carefully studied in many other countries all over the world. To facilitate growth in the broadcast sector, the country is planning and preparing for the entry of Digital Terrestrial Television (DTT) broadcasting. In 2010, the National Telecommunications Commission (NTC) released Memorandum Circular No. 02-06-2010 that issued the adoption of the Japanese digital broadcast standard called Integrated Services Digital Broadcast – Terrestrial (ISDB-T) for the country's impending migration to DTT broadcasting.

e-Government Systems

Current advancements in ICT services and applications have driven a trend towards new ways to link the government and its citizens. This has opened opportunities to improve the sharing of public information and to enhance the delivery of public services.

[26] Source: Universal Mccann International Social Media Research Wave 3, March 2008

As an indispensable step, various government agencies have been developing and enhancing their accessibility in the Internet, among others. As of September 2010, 304 or 93.8 percent of NGAs had established their own websites or portals and were in various stages of enhancing their web-presence (see Figure 5.8). A total of 14 NGAs (4.3%) are in Stage 4 characterized as government portals allowing for two-way transactional interactions; 93 NGAs (28.7%), Stage 3 (with interactive features on the website, including downloadable forms); 150 NGAs (46.3 percent) are at Stage 2, with frequently updated or "dynamic" websites; and 47 NGAs (14.5%) are at Stage 1 (comprises of only an official website or "static" websites).

Issues, Gaps, and Challenges

Despite the significant progress in terms of wider access and availability of ICT services, a number of perennial issues and problems continue to affect the Philippine ICT sector.

1. Gaps in communications and information access/services, particularly, low coverage, penetration, and uptake of Internet and broadband

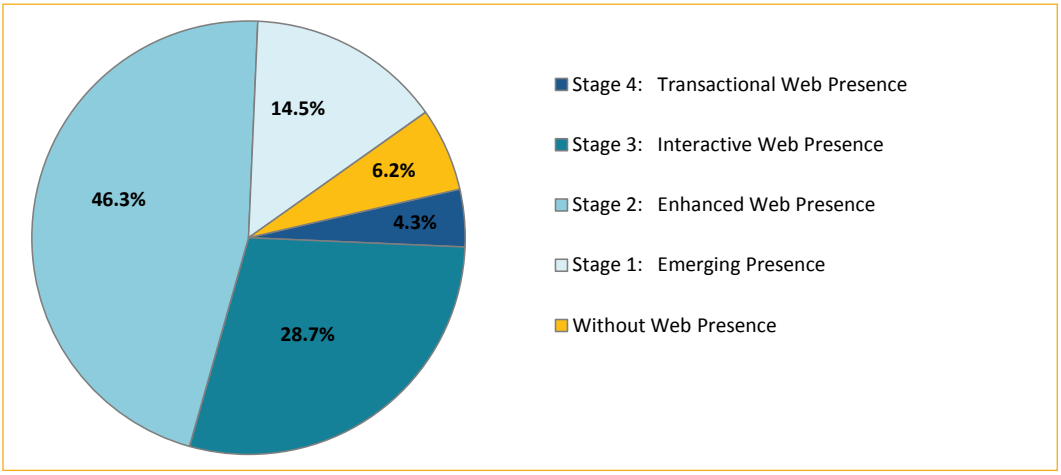
Despite growth in the ICT sector, the pattern of this growth, particularly the rate of catch-up, differs among the types of ICT services and their deployment across the regions. Among the available ICT services in the market, CMTS has the biggest advantage in terms of coverage and subscription, while Internet, especially broadband access, still lags.

Table 5.7 Internet Connection in Public High Schools per Region: 2009

REGION	TOTAL NO. OF PUBLIC HS	CONNECTED		WITHOUT CONNECTION		
		No. of HS	% Connected	w/in Telco area	out of Telco area	% Unconnected
National	6650	1936	29.1	1150	3564	70.9
NCR	220	157	71.4	63	0	28.6
CAR	243	7	2.9	46	190	97.1
I	461	81	17.6	101	279	82.4
II	350	26	7.4	33	291	92.6
III	502	115	22.9	81	306	77.1
IV-A	578	214	37	118	246	63
IV-B	340	34	10	39	267	90
V	582	38	6.5	78	466	93.5
VI	603	139	23.1	185	279	76.9
VII	610	298	48.9	107	205	51.1
VIII	397	70	17.6	88	239	82.4
IX	330	144	43.6	21	165	56.4
X	278	154	55.4	55	69	44.6
XI	279	61	21.9	76	142	78.1
XII	332	233	70.2	16	83	29.8
XIII	297	64	21.5	34	199	78.5
ARMM	248	101	40.7	9	138	59.3

Source: Japan International Cooperation Agency (JICA) Study

Figure 5.8 State of Web Presence among NGAs[/a] as of September 2010



Source: National Computer Center (NCC)
[/a] Stages of Web presence based on the United Nations and the American Society of Public Administration (UN-ASPA) standards

A wide disparity in the availability and level of ICT infrastructure and services, especially between major urban centers and rural areas.

While the ICT sector is and should be private sector-led, government must continue to cultivate an enabling regulatory environment that ensures competition and a level playing field for the provision of ICT infrastructure and services.

There are still a number of issues and inadequacies in the current structure of government information network and state of e-government system.

The current infrastructure (backbone network) already connects most of the Philippines, but there are still gaps in connecting a significant number of end users, such as communities, households, schools, as well as local units and agencies of government, especially in the rural areas. This suggests a wide disparity in the availability and level of ICT infrastructure and services, especially between major urban centers and rural areas. Profitability issues and situations in sparsely populated rural areas, including lack of important infrastructure support (e.g., availability of electricity and transport system) and possible risks of lower demand and subscriber base, preclude the entry of private operators.

It is recognized that the task of developing the country's ICT infrastructure primarily resides with the private sector. If broadband connectivity, however, is fully left to market mechanisms, it likely will be deployed by the private sector to urban centers only, with very limited roll-out in rural areas. Moreover, there is also a need to ensure that the benefits of the Internet and related technologies, including participation in ICT investment and opportunities, is made available into all segments of the population, including those who are disadvantaged due to education, age, gender, disabilities, ethnicity, income and those who live in remote regions.

The growth in the country's population has also driven an increasing demand for high-speed bandwidth and high-capacity application.

2. The legal and regulatory environment may not be as conducive for investments in ICT infrastructure

There is a need to pursue various legal and regulatory reforms to ensure that these do not bar nor impede improved private sector investments in ICT. Furthermore, institutional reforms require that the policy and regulatory bodies of the government be strengthened and their independence and autonomy, including provision of well defined qualifications and fixed term of the commissioner, be reinforced as in the case of NTC.

While the ICT sector is and should be private sector-led, government must continue to cultivate an enabling regulatory environment that ensures competition and a level playing field for the provision of

ICT infrastructure and services. The growing popularity and importance of Internet and broadband has also driven increased competition and thus, poses a greater challenge on how to make these services accessible to a larger market base.

There is also lack of "Green ICT" policies and initiatives to help manage the effects of ICT on the environment and climate change. With the rapid pace of technology adoption, the practice of green ICT should be more strongly instituted in all sectors, not only in ICT.

3. Inadequate infrastructure support for e-Government system

Despite previous e-government initiatives undertaken by the government, there are still a number of issues and inadequacies in the current structure of government information network and state of e-government system. While web presence among NGAs are continuously evolving through establishment of web portals, LGUs especially in the local areas are limited by lack of appropriate infrastructure, technical features and interface. For a developing country that has a low level of Internet and broadband access, the substantial benefits of true e-government system would still be difficult to capture.

Furthermore, various government bodies are currently developing and maintaining individual telecommunications networks, resulting in seemingly fragmented development of government ICT applications. The bigger challenge is to develop a more integrated government communications network that allows for connecting and accessing ICT systems of various regional, provincial and LGU government offices nationwide.

Strategic Plan and Focus

Developing the ICT infrastructure is significant to support the socioeconomic growth requirements and opportunities of the county. Under the current framework, ICT infrastructure and services are primarily provided by private telecommunications operators, driven mainly by user demand. There are areas, however, that are too remote or difficult for private sector players to enter. Thus, while private sector investments will remain the key enabler, the government's role is equally important in ensuring provision of ICT access and services for all, and in facilitating an enabling environment through appropriate policy measures and regulatory reforms to help sustain and further encourage private sector initiatives.

To provide fast, reliable and affordable access to communications services and information

Driven by the increasing demand for high-speed and high capacity voice, video, and data services and applications, the private sector will continue to play a major role in the sectoral growth. It will still provide the bulk of investments towards the build-up and expansion of the ICT infrastructure networks and offer better and innovative services to the public. Equally important government interventions will include ensuring that digital opportunities from ICT are enjoyed by all Filipinos in both urban and rural areas alike. Since telephony, particularly though CMTS, has achieved a greater advantage in terms of access and usage, there is now a stronger focus on achieving universal access and service for Internet and broadband, especially for providing digital opportunities in the unserved and rural areas. Hence, the following strategies will be pursued:

While private sector investments will remain the key enabler, the government's role is equally important in ensuring provision of ICT access and services for all, and in facilitating an enabling environment through appropriate policy measures and regulatory reforms to help sustain and further encourage private sector initiatives.

Since telephony, particularly though CMTS, has achieved a greater advantage in terms of access and usage, there is now a stronger focus on achieving universal access and service for Internet and broadband, especially for providing digital opportunities in the unserved and rural areas.

1. Provide incentives to facilitate ICT infrastructure investments, particularly in the rural and unserved areas

Providing universal access to areas not considered viable by the private sector is not a new challenge. In these areas therefore, the government can play a more active role in supporting and encouraging private initiatives.

Create a Universal Access and Service Fund utilizing spectrum user fees (SUF)

The NTC already collects SUFs, which telecommunications operators pass on to consumers through service fees (about PhP2 billion collected annually and remitted to the National Treasury). These funds can be used to build ICT infrastructure in rural areas by institutionalizing the use of SUFs to create a Universal Access and Service Fund (UASF).

Part of the UASF may be allocated for providing "smart subsidies"[27] to aid prospective private operators in investing in the rural and unserved areas of the country. The fund may also be used in developing various broadband requirements of the public, particularly in education, health and for ICT awareness and capacity-building activities. In this initiative, mechanisms to ensure transparency and accountability, preferably with multisectoral participation, would have to be institutionalized.

2. Establish sustainable Community e-Center (CeC) Program

With the currently low level of broadband coverage and PC penetration, the government can support establishment of shared access facilities to cater for rural and unserved areas. The CeC is an example of a self-sustaining shared facility providing affordable access to ICT-enabled services and relevant content. While a number of CeCs have been successfully established across the country, the government shall further support their sustainability and further expand to other access points, with the objective of establishing a CeC in every barangay. The government will also push for capacity building programs for CeC workers to develop their business and entrepreneurial skills in maintaining the facilities as well as aggregating CeC needs and services to increase awareness and private sector interest.

The CeC is an example of a self-sustaining shared facility providing affordable access to ICT-enabled services and relevant content.

The government shall further support their sustainability and further expand to other access points, with the objective of establishing a CeC in every barangay.

3. Implement measures to ensure security and privacy of data in a network and the transmission infrastructure

With the rising number of people, institutions and organizations linked online, as well as the increasing number of ways by which people utilize the Internet, safety, security and privacy issues become of utmost importance. Hence, the following shall be pursued:

a. Improve the country's cybersecurity threat prevention, detection and response capabilities for critical infrastructure, including reliability and robustness to withstand threats and damages caused by natural disasters, terrorism, and other threats

b. Constant audit of computer systems and resources that should be made mandatory by all institutions using ICT;

c. Issuance of technical guidelines, advisories and bulletins on the

[27] Smart Subsidies are one-time financial incentives intended to help "kick-start" rural telecommunications roll-out. It is not meant to cover the full cost of infrastructure roll-out, but rather to merely support investment, without creating subsidy dependency.

protection of computer systems from hacking and unauthorized access, among others; and

d. Maintain a pool of cybersecurity experts in government agencies to extend emergency technical assistance to solve reconstruction of damaged data/systems and possible reconstruction to prevent recurrence of cybersecurity-related events.

To cultivate an enabling environment to further attract and sustain private sector investments in ICT infrastructure development

Creating a legal and regulatory environment that is more consistent, transparent and conducive for investment will sustain current efforts in spurring economic growth and availing of digital opportunities in the country.

Consistency, transparency, and predictability of rules encourage investments that are critical in sustaining the efforts to deploy and promote ICTs for economic growth. Regulatory reform will also help engage the private sector, and enhance the prospects for financial sustainability and viability of ICT access points.

The regulatory environment should facilitate a level playing field through clear and updated policies, including review of existing regulations on frequency and proper spectrum allocation/distribution, to further promote competition for existing operators and new entrants. The following strategies will be pursued to this end:

1. Pursue legal, regulatory and policy reforms

The following proposed legislations and other regulatory and policy reforms shall be pursued:

a. Establish the Department of Information and Communications Technology (DICT) (via the "DICT Bill"). The DICT shall be established to coordinate and implement the national ICT development agenda, policies, programs and projects. Transforming the CICT into the DICT should result in a thorough implementation of the national e-strategies cutting across other critical sectors such as e-education and e-health, and the country's representation in international and regional ICT bodies.

b. Strengthening of the National Telecommunications Commission (NTC) through the "NTC Reorganization Bill". The NTC shall be strengthened by making its charter responsive to technological and market changes .

It will also be strengthened by setting fixed terms for qualified members of the collegial body, vesting each member with authority independent of any political and personal influence during their term of office. The body's fiscal autonomy in the implementation of sector plans and programs shall also be secured.

c. Competition Policy for the ICT Sector. A competitive market is said to be the most efficient mechanism for developing a modern, ubiquitous, and affordable information infrastructure. A competition policy framework for the ICT Sector shall be developed under the leadership of CICT and with the full participation and support of the sector stakeholders. This framework can be used to correct the flaws in the regulatory environment that restrain competition and prevent markets from functioning efficiently.

This framework, moreover, will guide future initiatives and decisions of both the regulator and the private sector as they contemplate competition-related issues. It will also guide the NTC in the exercise of its regulatory functions and as it attempts to balance various public goals, including achieving universal service by making affordable ICT services available to all citizens, ensuring that consumers have access to high-quality products and services, and preventing the exercise of undue market power by firms.

d. Reassessment of Republic Act No. 7925 or the "Public Telecommunications Policy Act of the Philippines, 1995". While RA 7925, which currently governs the ICT sector, is rightly credited with fostering competition and accelerating investments in the sector, it has become superannuated owing to new technologies (such as the Internet and Voice over Internet Protocol) and business models that were not anticipated at the time the law was passed. Other laws are similarly outdated. The Radio Law (RA 3846), for example, constrains the NTC in the issuance of licenses and assignment of radio spectra that could otherwise help bridge the last mile in rural and unserved areas. There is also a need to revisit pre-Internet laws that, in the face of rapid and continuing technological change, now handicaps the NTC as it struggles to respond to the sector's needs and the public demand for competitively priced and a wider choice of ICT goods and services.

Adequate and efficient infrastructure support must be provided to enhance an e-government system that will allow more effective exchange and processing of data across NGAs and to enhance government's capability to deliver services electronically directly to citizens.

e. Convergence Bill / Information and Communications Policy Act. The passage of a Convergence bill must be pursued in order to rationalize all pertinent laws; provide a technology-neutral legal basis and tool to encourage investment into the ICT sector and the deployment of infrastructure and services to the rural and unserved areas; permit the continued development of new technlogies; and criminalize cable theft, including theft of cable TV signals and other infrastructure.

f. Frequency Spectrum Management. There is a need for greater efficiency and transparency in spectrum regulation and allocation to better aid the private sector efforts in providing ICT infrastructure and services, particularly in unserved and underserved areas. This would also help facilitate allocating frequencies for players that would be interested in providing broadband (e.g., WiMAX) and other wireless technologies in unserved communities.

g. Intellectual Property Rights (IPR) Reform. A strong and demonstrated commitment to protect Intellectual Property Rights will enhance national competitiveness and encourage the development of local innovations and technologies. Efforts shall be undertaken to enhance protection for intellectual property thru antipiracy campaigns and amendments to the Copyright Law and the IP code. Such laws and campaigns will also provide for parallel support and initiatives to ensure universal access to and deployment of new technologies, applications and knowledge.

h. Digital Terrestrial Television (DTT) Broadcasting switchover. Subsequent to the recent adoption of the ISDB-T standard for the country, the government, in coordination with the broadcast industry and concerned stakeholders, will embark on DTT broadcasting migration, guided by the issuance of the implementing rules and regulations for the digital switchover. The digital transition is expected to help facilitate growth in the broadcast sector through improved quality of television broadcast systems and programming, as well as for a more efficient utilization of the broadcast frequency spectrum.

i. "Green ICT" Policies. The adoption of Green IT as a technology will reduce the ill-effects of unregulated ICT particularly to human health and the environment. This includes

exploring how ICT applications can be used in such a way as to conserve and optimize energy use. For instance, it uses computers that require lower power input thereby producing less radiation to the user and to the environment. Green IT also deals with the proper disposal of obsolete computers and IT equipment, and pushes for a paperless society.

Thus, crafting appropriate guidelines and policies to address the negative impacts of ICT infrastructures will be pursued, addressing appropriate disposal of ICT equipment, among others.

To achieve increased transparency, efficiency and trust in Government through enhancement of e–government systems

E–Government systems serve as important mechanisms for increased transparency, efficiency and trust in government. Thus, the following will be pursued:

Provide adequate and efficient infrastructure support to enhance e-government systems

Adequate and efficient infrastructure support must be provided to enhance an e-government system that will allow more effective exchange and processing of data across NGAs and to enhance government's capability to deliver services electronically directly to citizens. This involves further enhancing e-government portals including the online payment facility. A secured data center and public key infrastructure (PKI) system for government transactions would also need to be established to encourage the use of the e-government Portal towards seamless transaction across agencies.

E-government applications in the LGU level should be promoted so that applications such as those for real property, business permitting, treasury and accounting, and other applications would be used by all LGUs to provide better services to their constituents and increase their revenues.

Interoperability of information systems across government bodies will also be pursued, by adopting standards and policies for interoperability and integration strategies. This will enable easier, more efficient exchanging and processing of data across NGAs applications. (Please refer to Chapter 7, "Good Governance and Rule of Law" for a more comprehensive discussion on good governance).

Social Infrastructure

Waste Management

Solid Waste Management

Assessment, Issues and Challenges

In the pursuit of sustainable development, the protection of public health and the environment should not be neglected. The proper management of waste is meant to safeguard resources. To improve its management of solid waste, the Philippines enacted RA 9003, otherwise known as the Philippine Ecological Solid Waste Management Act (ESWMA) of 2000, which enunciates the government's policy of "adopt[ing] a systematic, comprehensive and ecological program of solid waste management program". Some of the salient provisions of the Implementing Rules and Regulations (IRR) of the ESWMA pertain to the following:

a. The creation of Solid Waste Management (SWM) Board in Metro Manila, every province, city and municipality and a SWM Committee in every barangay;

b. The formulation of a National Waste Management Framework;

Compliance with the ESWMA, however, has been weak and the targets set therein have yet to be attained.

c. Submission of Local Government Solid Waste Management Plans;

d. Conversion of open dumpsites into controlled dumpsites;

e. Conversion of controlled dumpsites into sanitary landfills; and

f. Establishment of a National Solid Waste Management Fund.

The National Solid Waste Management Framework provides for the reduction, reuse, and recycling (3Rs) of municipal solid wastes and treatment of the hazardous components and residual waste management through sanitary landfills or the use of alternative technologies to process and or treat the waste. The policy is people-centered, where citizens are expected to play a major role in segregating solid waste at source (household level).

The limited investment capacity of LGUs and the perceived low willingness of LGU constituents to pay for SWM services have been considered as the main reasons for the underperformance in achieving the ESWMA targets.

Compliance with the ESWMA, however, has been weak and the targets set therein have yet to be attained:

a. Only 338 LGUs have completed their Solid Waste Management Plans or 20.9 percent of the 1,610 cities and municipalities have completed their Solid Waste Management Plans. In Metro Manila, only eight out of 17 cities and municipalities (47 percent) have complete plans;

b. Nationwide, only 7,680 out of 42,000 barangays are covered by Materials Recovery Facilities (MRFs) for a compliance rate of 18.28 percent. In Metro Manila, 685 out of 897 barangays are covered by MRFs, or a compliance rate of 76 percent; and

c. Of 1,205 disposal facilities in the country, 1,172 are open and controlled dumpsites, and only 33 are sanitary landfills serving 75 LGUs nationwide, for a compliance rate of only 2.7 percent. In Metro Manila, there are two disposal facilities. There is a controlled dumpsite in Payatas scheduled for closure by the end of 2010; the other is a sanitary landfill in Navotas. Most Metro Manila LGUs dispose of their residual wastes in sanitary landfills outside the metropolitan area.

Each Filipino generates between 0.30 and 0.684 kg. of solid waste daily, depending on where this occurs. NCR posted the highest waste generation rate of about 0.7 kg per capita per day, while ARMM is the lowest with 0.30 kg per capita per day. Total waste generation is 35,154 tons per day, or 12.83 million tons every year.

Upfront capital costs of SWM are high, thus limiting the financial capacity of LGUs to invest in such projects. The limited investment capacity of LGUs and the perceived low willingness of LGU constituents to pay for SWM services have been considered as the main reasons for the underperformance in achieving the ESWMA targets.

To augment the financial capability of LGUs, the revised NG-LGU Cost-Sharing Framework for SWM was approved in 2009 allowing NG to provide grants to LGUs of up to 40 percent of the total cost of a SWM project. Table 5.8 shows the NG-LGU cost-sharing framework.

Issues and Challenges

Notwithstanding various initiatives in the sector, several issues and challenges still remain to be addressed, notably the following:

a. the slow progress in the implementation of the ESWMA;

b. the lack of short- and long-term solutions to properly address problems on SWM;

c. overlapping national and local policies;

Table 5.8 NG–LGU Cost–Sharing Framework (in percent)

LGU Income Class	Municipalities and Provinces		Cities	
	NG Grant	LGU Share	NG Grant	LGU Share
1st and 2nd	20	80	40	60
3rd and 4th	40	60	25	75
5th and 6th	50	50	20	80

d. the need for massive implementation of 3Rs at the Household and Barangay level;

e. the need to improve and upgrade the national database for SWM;

f. the lack of sufficient trained personnel at the national and local level; and

g. the need to fully utilize the National Ecology Center (NEC) and the Regional Ecology Centers (RECs).

Strategic Plan and Focus

To implement the provisions of RA 9003, there is a need to address waste problems/issues holistically. Each concerned area should develop a concrete action plan to address the challenges of the sector, provide the necessary funds for the operation of SWM facilities, and educate the public on the impact of SWM not only as a means to protect the environment, but also as a way to sustain and support social development.

To ensure suitable/sustainable SWM

Fully implement the ESWMA

- Pursue the closure and rehabilitation of all open/controlled dumpsites and the construction of sanitary landfills to increase service coverage to more LGUs;
- Support the massive implementation of the 3Rs through the establishment of more MRFs and materials recovery systems (MRS);
- Assist LGUs in formulating their respective 10-year SWM Plans; and
- Establish a start-up fund to accelerate the implementation of the ESWMA. National funds are needed to start the different tasks of the NEC and to implement the SWM approaches.

Pursue the closure and rehabilitation of all open/controlled dumpsites and the construction of sanitary landfills to increase service coverage to more LGUs;

Generate basic information for SWM that can be used in different programs and projects to properly implement the provisions of RA 9003

- Develop a framework for setting-up baseline data/indicators on SWM at the LGU level. These shall include the establishment of a monitoring and evaluation system through the development of an accessible database on waste characteristics, diversion rate, LGU compliance, alternative technologies and other parameters that will foster better information exchange; and
- Fully utilize NEC and RECs to act as hubs for information, networking, and technology showcasing and advocacy.
- (Other detailed strategies are discussed in Chapter 10 on the "Conservation, Protection, and Rehabilitation of Ensuring Ecological Integrity Towards Sustainable Development".)

Health Care Wastes

Assessment, Issues, and Challenges

There are around 2,100 public and private hospitals nationwide with an approximate capacity of 96,000 beds, generating 28,000 kg. of health care wastes (HCW) per day at an average of 0.30 kg. per bed capacity per day. On the other hand, there are around 680 public hospitals with an approximate capacity of 44,000 beds generating 13,200 kg. of HCW per day. The NCR has the largest bed capacity (approximately 30,000 beds) which can generate 9,000 kg. of HCW per day. The volume does not include the amount of wastes from small clinics, stand-alone laboratories, research laboratories, municipal health centers and barangay health stations, which generate mostly general or domestic health care wastes.

The general distribution of health care wastes is as follows: general or domestic wastes (80%); pathological and infectious wastes (15%); chemical and pharmaceutical wastes (3% percent); sharps (1%); radioactive wastes, cystostatic wastes, pressurized containers, broken thermometers and used batteries (less than 1%).

As the lead government agency in the formulation of national guidelines for health care waste management, the DOH requires all health facilities to follow correct procedures in the five-stage process of health care waste management: (a) waste minimization and segregation; (b) waste handling and collection; (c) waste internal transport and temporary storage; (d) waste treatment; and (e) final disposal.

Complying with the five-stage process is a responsibility of HCW sources or generators themselves, consisting mostly of private and public hospitals. Private hospitals are responsible for their own investments in equipment operations and personnel for HCW management. Public hospitals, on the other hand, need to justify and apply for an annual budget for HCW.

Since the Clean Air Act (RA 8749) of 1999 and its IRRs were issued, the health sector has been limited to nonburn technologies for the treatment of HCW, such as wet thermal disinfection or autoclaving, microwave, chemical disinfection and the biological process. The first two technologies are largely imported and usually costly.

Hospitals must determine which technology best meets the needs of HCW management while minimizing the impact to the environment and enhancing the safety of the hospitals and the general public.

Public and private hospitals in the NCR contract out the treatment and final disposal of their HCW to private companies called Transport, Storage, Disposal (TSD) facility operators. At present, there are 10 accredited TSD facility operators serving public and private hospitals in the NCR and nearby regions. Elsewhere in the country, however, TSD facility operators are nonexistent and public and private hospitals must rely on inhouse options and technology for waste treatment and disposal.

Of the 72 hospitals managed by the DOH, 30 percent are located mostly in Metro Manila and contract out their waste treatment and disposal requirements. Most use chemical disinfection for waste treatment and have limited or no access to a sanitary landfill for the final disposal of treated wastes. Of these same 72 hospitals managed by the DOH, 90 percent have existing sewage treatment plants or are currently in the process of installing these facilities.

At present, there are 10 accredited TSD facility operators serving public and private hospitals in the NCR and nearby regions. Elsewhere in the country, however, TSD facility operators are nonexistent and public and private hospitals must rely on inhouse options and technology for waste treatment and disposal.

There are some 111 TSD facilities nationwide, most of which are in Luzon. Other urban and industrialized regions have only a limited capacity for treatment and disposal of hazardous wastes, hence the problem of their disposal.

Develop an interactive database to track chemicals and hazardous wastes.

Strategic Plan and Focus

To ensure hygienic/sanitary disposal of health care waste

1. Minimize the spread of health care wastes at the source

Institutionalize HCW management system in health facilities through investment in training and communications. Schools that include HCW management processes in their technical curricula should be given incentives; and

Ensure that mercury and other harmful metals are not released to the environment through the elimination of the use of mercury-based medical equipment and devices.

2. Enhance access of hospitals and health facilities to technologies, products and services to assure compliance with health care waste management guidelines

- Engage LGUs in PPP options and financial schemes for the establishment of large-scale waste treatment technologies. The development of BOT projects for cooperative waste treatment facilities and sanitary landfills is a viable option;
- Provide incentives to private investment for the promotion of research, development and manufacture of nonmercury-based devices and technologies used in health facilities and for health care; and
- Encourage the development and manufacturing of local waste treatment technology and ensure their availability in the market.

Toxic Chemicals and Hazardous Wastes

Assessment, Issues, and Challenges

The DENR through the EMB regulates the movement and disposal of toxic chemicals and hazardous wastes in the country. There are 46,823 existing chemicals in the country in the updated Philippine Inventory of Chemicals and Chemical Substances (PICCS) and 48 toxic chemicals are not included in the Priority Chemical List (PCL) for strict monitoring.

There are about 11,162 registered hazardous waste generators (HWGs) and 262 registered transporters. The top three hazardous wastes generated are putrescible/ organic wastes, waste oil, and wastes with cyanide. Based on export clearances issued by EMB, approximately forty percent of those exported hazardous wastes were sludge that contain copper, silver, etc. There are some 111 TSD facilities nationwide, most of which are in Luzon. Other urban and industrialized regions have only a limited capacity for treatment and disposal of hazardous wastes, hence the problem of their disposal.

The key challenge is how to properly track and monitor the handling and disposal of toxic chemicals and hazardous wastes.

Strategic Plan and Focus

To ensure proper and sustainable disposal of toxic chemicals and hazardous waste

1. Improve the hazardous waste management of industries/establishments and increase compliance with regulatory policies pertaining to the importation of toxic chemicals and substances and the transportation, storage, handling and disposal of hazardous wastes

- Strengthen the enforcement and implementation of RA 6969 on the control of toxic chemicals and

The magnitude of housing need, defined as the housing backlog plus new households, is enormous and is estimated to reach about 5.8 million housing units in 2016.

Accelerate mass housing programs with alternative housing technologies, schemes and approaches to ensure decent and affordable homes.

Integrate basic infrastructure support to resettlement sites and emerging regional sustainable communities, such as provision of potable water, safe and sufficient electricity, access roads to the nearest commercial centers, and ICT, among others;

hazardous wastes through survey and monitoring activities; and

- Develop an interactive database to track chemicals and hazardous wastes.

2. Minimize chemical-related incidents and the risks to the environment and to public health posed by improper management of hazardous wastes by industries

- Develop a national plan for chemical incident prevention; and

- Embark on a massive information and education campaign and continuously coordinate with LGUs and other government agencies and

Housing

Assessment, Issues and Challenges

The National Urban Development and Housing Framework (NUDHF) 2009-2016 finds the housing problem to be serious and is a largely urban phenomenon. The magnitude of housing need, defined as the housing backlog plus new households, is enormous and is estimated to reach about 5.8 million housing units in 2016 (Chapter on Social Development). In Metro Manila, the total backlog has been projected to reach 496,928 housing units. Innovative and high-density housing strategies are required if the housing deficit is to be effectively addressed.

Beyond the public sector providing housing and the auxiliary services, new approaches are needed in the face of continuing rural-urban migration that is bound to exacerbate the housing problem. The affordability of and access to government housing programs by the poor will also continue to pose a major challenge in the near future.

The housing problem is evident in the proliferation of slums and informal settlements in the urban areas. Recent estimates show that more than a third of urban populations are slum dwellers. In Metro Manila there were about 581,059 informal settlers (data from HUDCC as of July 26, 2010). These communities are characterized by unsanitary conditions, congestion, and limited access to basic urban services (e.g., health centers, schools, waste disposal, safe water supply). Resettlement and relocation programs have been implemented but have attained limited success in providing employment, livelihood opportunities, and adequate services to many of the relocatees.

Government has allocated less than 1.0 percent of the total government expenditures for the housing sector in recent years, or less than one-tenth of a percent of GDP on the average. This makes Philippine public spending on housing one of the lowest in Asia. (Habito, 2009)[28]

The role of government in providing access to housing opportunities and services must be clarified. In the last four decades, government response to the housing problem has failed to rectify the fundamental issues of providing shelter, especially for the poor.

Strategic Plan and Focus

The housing sector is guided by the theme: *Gaganda ang buhay kung may bahay at hanap-buhay* (Life will improve with housing and livelihood.) The vision is to provide a holistic framework of a home and eventually a harmonious community through provision of housing infrastructure, integration of basic services, and implementation of appropriate housing/construction standards. It targets the provision of some 1.47 million housing units for the Plan period 2011-2016.[29]

[28] This is based on Habito's 2009 paper for the Asian Development Bank (ADB).

[29] See Table 8.10 under Housing section of Chapter 7: Social Development.

To address the housing needs and gaps in basic services, especially for the poor and marginalized

a. Accelerate mass housing programs with alternative housing technologies, schemes and approaches to ensure decent and affordable homes. In relation to this, the following will also be undertaken:

- Employ labor-intensive method in the implementation of housing projects wherever feasible to generate employment in the beneficiary communities;
- Develop and implement the appropriate standards in the construction of the housing units to incorporate DRRM and CCA;
- Explore vertical expansion in the construction of housing units taking into consideration the basic geographical location, soil quality and other environmental considerations; and
- Explore the use of indigenous and recyclable materials as environment-friendly alternatives to reduce cost in building houses.

b. Integrate basic infrastructure support to resettlement sites and emerging regional sustainable communities, such as provision of potable water, safe and sufficient electricity, access roads to the nearest commercial centers, and ICT, among others;

c. Ensure that all government infrastructure projects integrate the relocation and resettlement requirements of affected families into their plans and costing in collaboration with other concerned agencies;

d. Develop a financing framework for relocation and resettlement, including workable PPP schemes for socialized housing development; and

e. Support LGUs efforts to develop a system of land inventory to better identify areas for urban growth and planned areas for human settlements through their Comprehensive Land Use Plans (CLUPs).

Health Facilities

Assessment, Issues and Challenges

Although health facilities have become available and accessible in most communities, many remain unaware of the services offered and consequently seek more specialized care in hospitals rather than their Rural Health Units (RHUs) or Barangay Health Stations (BHS). Government primary health facilities are conveniently located, with 94 percent of households being within 15-minute walking distance to an RHU or BHS. Such facilities are frequently bypassed, however, for more specialized care. RHU resources remain underutilized, while higher level facilities are overcrowded, unnecessarily causing a state of inaccessibility.

In terms of health facility utilization, the Filipino Report Card on Pro-Poor Services in 2000 showed that 77 percent of households surveyed used health facilities of one type or another. Compared with rural households, urban households tended to use health facility services more. Because of the lower cost of health services, patients more frequently utilized government facilities than private facilities. Rich households and urban dwellers were the predominant users of private facilities.

From 2007 to 2010, the government allotted PhP8.43 Billion to upgrade around 1,176 health facilities nationwide.

Invest in the Health Facility Enhancement Program that defines a unified and rationalized health facility blueprint covering both public and private health facilities.

Increase public investment for health and rationalize the use of all sources of funds for health, including the national and local government budgets and resources from Philippine Amusement and Gaming Corporation, Philippine Charity Sweepstakes Office and other extra-budgetary resources for health.

Table 5.9 Summary of DOH Infrastructure and Equipment: 2007-2010

	RHU-BHS	Level 1	Level 2	Level 3	Level 4	Others	TOTAL	%
NCR	0	1	8	1	5	3	18	1.5
CHD 1	21	9	6	1	1	1	39	3.3
CHD 2	102	11	10	0	1	2	126	10.7
CAR	112	10	14	0	1	0	137	11.6
CHD 3	3	5	46	1	4	0	59	5.0
CHD 4A	14	3	10	1	2	0	30	2.6
CHD 4B	82	14	14	0	0	0	110	9.4
CHD 5	5	16	15	3	1	0	40	3.4
CHD 6	76	8	29	2	2	0	117	9.9
CHD 7	17	10	14	1	2	1	45	3.8
CHD 8	42	14	20	2	0	1	79	6.7
CHD 9	33	10	9	0	2	0	54	4.6
CHD 10	36	20	11	2	1	1	71	6.0
CHD 11	53	15	7	2	2	1	80	6.8
CHD 12	64	17	9	1	1	0	92	7.8
CARAGA	9	8	2	2	0	2	23	2.0
ARMM	27	12	5	0	0	0	44	3.7
MM HOSP	0	0	1	0	9	2	12	1.0
TOTAL	696	183	230	19	34	14	1176	100.0

Source: DOH

Table 5.10 2011 DBM Budget Gaps

Purpose	DOH Request (Required for MDGs) (in PhP Billion)	DBM-Approved (within DOH ceiling for 2011) (in PhP Billion)	GAP (in PhP Billion)
BEmONC, 2754 units	9.6	5.75	3.85
CEmONC, 300 units	9	0	9
DOH Hospital Upgrading (66 Hospitals)	9.6	1.39	8.21
	28.2	7.14	21.06

For 2011, infrastructure in the health sector will require additional funding because of limited funds for health facilities such as Basic and Comprehensive Emergency Obstretic and Neonatal Care (B/CEmONC) facilities, in addition to the DOH-retained and -maintained hospitals.

Strategic Plan and Focus

To improve access to and quality of health facilities

1. Ensure coordinated and appropriate planning and development

- Invest in the Health Facility Enhancement Program (HFEP) that defines a unified and rationalized health facility blueprint covering both public and private health facilities;

- Link provincial or city plans to the national allocation of investments for health, including acquisition of ROW and lands set aside for the construction of health facilities;

- Improve access to specialized services in subnational health facilities and enhance the quality-assurance system for public health facilities like the RHUs and BHSs. Provision of necessary access road to the RHUs and BHSs, especially in the remote areas, must be considered in the planning and development of health facilities;

• Increase the percentage of public and private hospitals for Continuous Quality Improvement (CQI);

• Strengthen the gate-keeping function of lower level facilities; and

• Integrate the provision of proper waste-management systems (e.g., hospital, toxic and solid waste) in the plans of all proposed and existing health facilities.

2. Facilitate project/program financing

• Increase public investment for health and rationalize the use of all sources of funds for health, including the national and local government budgets and resources from Philippine Amusement and Gaming Corporation (PAGCOR), Philippine Charity Sweepstakes Office (PCSO) and other extra-budgetary resources for health. These resources should be utilized to ensure that available accredited facilities are accessible to each Filipino family while improving the health service packages provided to them, including catastrophic spending; and

• Enforce fiscal and administrative autonomy in all DOH-retained facilities in exchange for capital outlay support and progressive and well-calibrated reallocation of hospital budgets to public health priorities. This will promote efficiency and improve healthcare services as well as secure investments. This can be achieved at the national level by pursuing corporate-style management in DOH-retained hospitals and promoting income retention at the LGU hospitals.

3. Improve project implementation and encourage the use of alternative materials and technologies

• Explore the use of indigenous and recyclable materials that are environment-friendly to reduce costs and incorporate DRRM and CCA concepts in building health facilities;

• Employ labor-intensive methods in implementing health infrastructure projects as a means to generate employment in the beneficiary communities; and

• Explore the possibilities of entering into PPPs in the construction, structural retrofitting, rehabilitation, maintenance and management of health facilities.

Education

Assessment, Issues and Challenges

The country is exerting all efforts to attain its education targets under the MDGs to improve quality, access and efficiency of education. Even as education has been identified as the central strategy for investing in people, reducing poverty, and building national competitiveness, the country has been cited as a "particularly striking example of under-performance" in educational reforms in the 2010 Education For All (EFA) Global Monitoring Report. Current policies have been cited as failing to make a difference in improving the education of the poorest Filipinos.

Among its other challenges, the Department of Education (DepEd) has perennially confronted the problem of classroom shortage. In SY 2009-2010 alone, the Department has a total of 18.2 million

The problem of shortage is exacerbated by damage to school buildings wrought by typhoons and other disasters.

Despite continuing efforts to build new schools and make the most of what is present, the shortage persists.

Closing the classroom gap and improving the quality of educational facilities will not only provide learners with the needed infrastructure for education, but also a conducive and suitable learning environment that will enhance the teaching-learning process, contributing to the improvement of their academic performance.

enrollees but was deficient by more than 100,000 classrooms in both elementary and secondary public schools. Budget allocations for classroom construction have never fully covered the needs of an increasing school population. The problem of shortage is exacerbated by damage to school buildings wrought by typhoons and other disasters. As the DepEd intensifies its campaign to enroll all school-age children, in line with its commitment to achieve universal participation, classroom requirements will rise even more. An additional challenge is the prospective passage of the bill on mandatory preschool education, which will require the construction of even more classrooms to accommodate incoming learners.

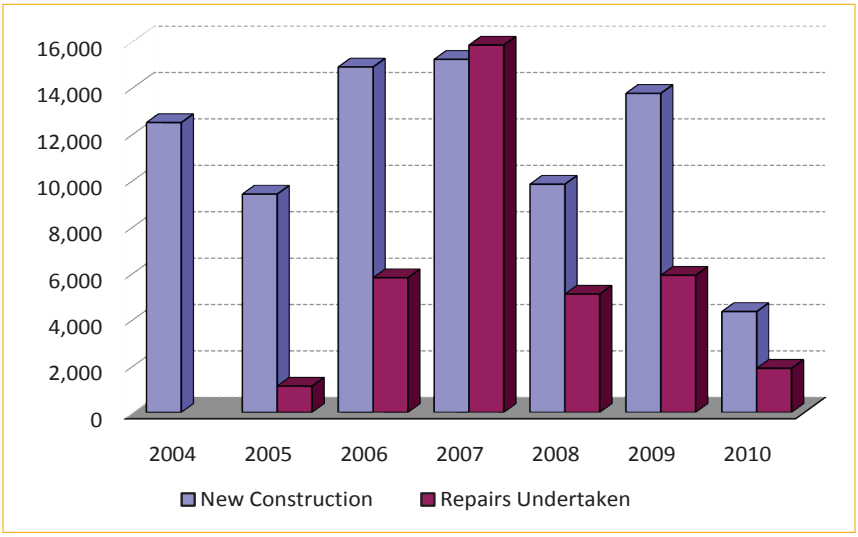
Issues and Challenges

Adequate classrooms are necessary for quality education. Several means have been employed to address this concern, but with a fast-growing population, shortages have never been eradicated. Since 2004, a total of 76,710 classrooms (elementary and high school combined) have been put up. This was achieved through the combined efforts of DepEd, DPWH, the local governments, private sector donors, school principals and members of Congress. Another response to reduce the pressure on infrastructure has been the use of alternative delivery modes (ADM) of education, such as the use of ICT. The availability of a database on ADM (e.g., the share of ADM to the total number of all learning delivery modes) will facilitate in determining the number of classroom required.

Despite continuing efforts to build new schools and make the most of what is present, the shortage persists. This is especially true in far-flung and remote areas. The total classroom requirement is 152,569 for all levels. For next school year, the estimated requirement for public schools is some 113,000 new classrooms, with an estimated cost of over PhP77 billion. This does not include the need for major repairs on 14 percent of existing classrooms estimated to cost PhP14 billion in 2011. The large demand for new classrooms makes the need for innovative approaches to the provision of classrooms even more urgent.

The damage caused by various calamities hitting the country present a further challenge to maintaining an adequate number of classrooms. This is also related to the typical use of public schools as temporary shelters for those affected by disasters.

Figure 5.9 New Classroom Construction and Repairs Undertaken: FY 2004–2010



To date, not all schools have adequate sanitation facilities, a fact that may lead to the degradation of students' health. This, in turn, may adversely affect the academic performance of students.

Closing the classroom gap and improving the quality of educational facilities will not only provide learners with the needed infrastructure for education, but also a conducive and suitable learning environment that will enhance the teaching-learning process, contributing to the improvement of their academic performance. Through this indirect but obvious way, addressing the infrastructure deficits in education contributes to economic growth and social development.

Strategic Plans and Focus

To ensure adequate and equitable provision of quality educational facilities

1. Close the classroom gap

- Sustain the DepEd School Building Program through the Basic Education Facilities Fund under the GAA and other funding sources.

- Provide continuing financial support for the construction of schoolbuildings in areas with acute shortages and for other programs under the Basic Education Facilities Fund; dilapidated or unusable school buildings, and those damaged by fire and other natural hazards, should also be rebuilt;

- Explore various procurement modalities under the government's PPP Program;

- Explore NG-LGU matching schemes for school building construction. Under this scheme, every school building constructed by NG in a certain area will be matched by the concerned LGU with the same number;

- Maximize classroom use of through class-shifts. The adoption of double-shift classes must be continued as long as it is needed in order to alleviate overcrowding in classrooms and to support efforts at addressing the classroom gap; and

- Explore the use of indigenous and recyclable materials as environment-friendly alternatives to reduce the cost of building classrooms.

2. Improve the quality of educational facilities

- Pursue the construction of disaster-resilient classrooms. It will be ensured that classrooms in areas prone to typhoons, earthquakes, and other natural hazards will be specially designed to withstand such calamities. This will minimize the need to rebuild and rehabilitate damaged classrooms, saving resources for other expenditures. In addition, schools are often used as temporary shelter for displaced, thus there is a need to strengthen and improve their design. School buildings shall be designed not only to be disaster-resilient but also so that these can be used as adequate evacuation centers to support the defense policy of providing tents and mobile trucks during calamities; and

- Provide for sufficient water and sanitation facilities in school construction. The recent outbreak of several diseases shows the need to focus on promoting proper hygiene and sanitation in schools. Schools should include adequate water and sanitation facilities to protect the health of children and teachers. Additional funding will be allotted for this purpose.