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Accommodating renewable energy programs for rural electrification through policy and sector change: a view of the world through the Philippines

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Important numbers: renewable energy contributed 20% of global electricity in 2011. Philippines privatized 92% of NPC assets as of 2010.

Introduction

Energy access, particularly electricity, is one of the most crucial components needed for economic and social development, especially in developing countries. It was estimated that about 1.3 billion people around the world lacked access to electricity in year 2009. [IEA, 2011] While the energy access gap has slowly been addressed, the challenge to meet universal access is expected to persist even beyond 2030. Providing electricity for all, however, requires the investment of large amounts of resources (energy). Climate change is an issue that emerged out of the global concern of excessive greenhouse gas emissions (GHG) resulting from massive consumption of energy resources (fossil fuel), Figure 1.

To address these concerns, the Kyoto Protocol in 1997, through the United Nations Framework Convention on Climate Change (UNFCCC), brought about certain commitments in industrialized countries to reduce GHG emissions. Along with the Millennium Development Goals` (MDG) benchmarks for environmental sustainability, it has since been made imperative to pursue energy provision considering environmentally sound solutions. It is in this respect that renewable energy solutions for energy provision have been vigorously sought by governments and development organizations alike.

The Philippine government recently promulgated its Renewable Energy Act of 2008 and is implementing one of the most comprehensive renewable energy development programs in Southeast Asia to promote renewable energy systems (RES). The Philippine energy industry scenario may prove an insightful case to understand how RESs have been accommodated through policy.

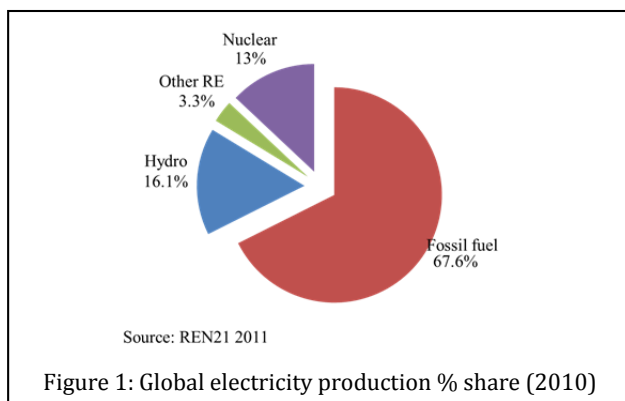
Policy and sector changes

The Philippine energy industry structure and system of operation has evolved itself from the precepts of the Electric Power Industry Reform Act of 2001 (EPIRA 2001). This law called for the restructuring of the power sector to promote competition, efficiency and energy security.

The following are the key features (objectives) of EPIRA 2001: (a) separation of the generation and transmission functions which was then monopolized by the National Power Corporation (NPC), a government owned entity; (b) privatization of the generation assets of NPC; (c) creation of a Wholesale Electricity Spot Market (WESM) which would allow competitive power supply from private groups; (d) promotion of indigenous and new renewable energy sources in power generation to reduce dependence on imported energy; (e) obligation of a Universal Charge to recover stranded costs of NPC and finance Missionary Electrification in remote and unviable areas which shall be serviced by the franchising utility or third parties;

The changes mandated by EPIRA have been realized in recent years. As of 2010, about 92% of NPC assets have been privatized while the WESM has been in function for the Luzon and Visayas grid. Amidst the reforms, key issues still remain: (a) timing an amount of privatization seem overly ambitious, (b) WESM may not function as planned, (c) security of power supply, (d) capacity building and regulatory strengthening are still required. [World Bank 2012]

Part of the salient features of EPIRA 2001 is the promotion of the use of indigenous and renewable energy sources for power generation in order to reduced energy (oil and coal) importation and improve energy security. This thrust would later on materialize into the Renewable Energy Act 2008. This act promotes the development, utilization, and commercialization of renewable energy resources. The following are key features (objectives) of the Renewable Energy Act of 2008: (a) accelerate the exploration and development of RE sources such as biomass, solar, wind, hydro, geothermal, and ocean energy to achieving energy self-reliance; (b) increase the utilization of RE resource through capacity development of national and local institutions and the provision of fiscal and non-fiscal incentives; (c) fiscal incentives for RE projects and developers: financial assistance from government banks, income tax holidays, duty-free importation of RE equipment, special tax rates on equipment and power sales, cash incentive for RE developers in missionary electrification, and establishment of a renewable energy trust fund (RETF) to finance research,



development, for widespread and productive use of RE systems; and; (d) non-fiscal incentives: mandates for the creation of renewable portfolio standards (RPS), establishment of a renewable energy market (REM) to trade RE certificates, availability of feed-in tariff (FIT), priority dispatch of RE in the grid, use of net metering for localized end-user RE production, establishment of green energy option, and eligibility of RE certificates for missionary areas;

With the above given industry structure and key policies, it is expected that the energy sector will experience more participation from private sector, more competitive energy pricing through the wholesale electricity spot market (WESM), and the gradual introduction of renewable energy systems (RES) to supply the grid. Furthermore, the rural electrification program is expected to make use of the universal charges to assist the spread of connectivity to unviable areas with a sense of priority (if viable) for off-grid RES.

The government's Rural Electrification Program pursues the continued electrification of un-energized villages and households. Though the structure of the working groups involved in rural electrification is quite complex, a few groups can be named: the Department of Energy (DOE), the National Electrification Administration (NEA), the Small Power Utilities Group (SPUG), the rural electric cooperative (ECs), and qualified third parties (QTPs).

Rural areas and Renewables

The benefits of rural electrification are generally perceivable: extended hours of productivity for work and education, enabled use of machinery for business, safe environment at night, and so on. These benefits can vary extensively depending on the ability of the household to make use of electricity for economically beneficial means. Furthermore, electrification has its environmental benefits as well. Un-energized households typically use kerosene lamps for lighting, which release some amounts of CO₂ (2.5kg CO₂ /liter of kerosene). Kerosene lamps are health hazards to the users (hazards for smoke inhalation and cause of fire). [DOE, 2011] If electricity is provided in a clean, safe and sustainable manner using RES, these health and environmental hazards can be avoided.

In recent years, renewable energy technologies have improved significantly and have gained more viable applications for small scale off-grid power generation. Among these are small scale wind, solar PV, biomass, and mini-hydro. RES have specific advantages for off-grid applications: faster procurement, sometimes more economical than grid connection, and clean for the environment. In the same manner, RES have also been found to have certain disadvantages such as high costs and technological complexities.

Challenges and the way forward

Studies have categorized issues related to rural electrification, particularly for RES, in developing countries into three categories: (a) economic - lack of subsidies and high initial capital costs of RESs; (b) legal and regulatory - inadequate legal frameworks and burdensome processes for developers; (c) financial and institutional - lack of access to credits for consumers and investors, and lack of capacity for technical, geographical, and commercial information about markets and technology. [Urmee, 2009] Despite these issues,

RES have been promoted in many countries for rural electrification.

The following are notable considerations in finding the way forward, accommodating RES along the way [World Bank, 2010]: (a) appropriate approaches for institutional, technical, and economic design and implementation are crucial for energy access programs which should be centrally monitored by government institutions and/or donor agencies; (b) programs should, as early as the planning stage, include the participation of the local communities and incorporate economically productive uses for electricity to ensure operational sustainability; and (c) while grid-extension would often be the cheapest way to provide electricity to people, off-grid connections for communities or households should incorporate innovative approaches including renewable energy systems (e.g. solar, wind, and hydro) which are scaled and priced according to the capacity of the community as well as to their needs.

An international movement

As of 2011, it was estimated that renewable energy contributed to almost 20% of global electricity supply and made up one quarter of the world's power generating capacity, as seen in Figure 1. This has been a result of the global efforts in the promotion of RE in the power generation mix. Several countries noted rapid growth of renewable energy supply; where China, United States, Canada, Brazil, Germany and India lead in terms of existing RE power capacity. [REN21, 2011] It was noted that by 2011, at least 118 countries, globally, had some type of renewable energy policy or target on a national level. These policies would include the following: regulatory policies (e.g. feed-in tariffs, RE portfolio standards, and tradable RE certificates), fiscal incentives (e.g. capital subsidies, tax holidays, and production payments), and public financing (e.g. investment loans and subsidies).

Making sense of it all

As the world continues to light up every unlit community, a constant balance between development and environment is evidently necessary. Renewable energy systems have paved the way to carry out the mission of electrification in a sustainable manner. The way forward, however, would require a comprehensive change. These changes have to come through molding proper policies and energy sector structures which can truly accommodate renewable energy programs. The developing and developed worlds have been active in pursuing these changes. The Philippines shows an example of how renewable energy systems can be promoted for rural electrification applications. Renewables require change – policy, sector, and mind-set change.

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