ANALYSIS: MYANMAR'S POWER WOES



Turning on the lights: Integrated energy and rural electrification development in Myanmar

Myanmar is blessed with natural and human resources, revealing the pressing need to upgrade its power sector.

lollowing Myanmar's 2010 election, the nation began to move from military rule and almost 60 years of stagnation, toward a democratic government and more open economy. Foreign and domestic stakeholders are gradually overcoming their concerns over whether this transition is sincere, initiating efforts to pursue emerging opportunities as well as to address numerous challenges. Blessed with abundant natural and human resources in a country that once possessed Southeast Asia's most dynamic economy, perhaps no economic issue is as pressing as the need to upgrade Myanmar's antiquated power sector. Presently, it is believed Myanmar's power grid connects to only about 30% of its 51 million people. More than half the wiring-in this country that is about the size of Texas-is estimated to be at least seventy years old.

National electrification is profoundly important. It is a central element and foundation upon which to achieve needed advances in education, healthcare, industrial and regional development. Job creation, tourism, telecommunications, financial services and governance are also More than half the wiring—in this country that is about the size of Texas—is estimated to be at least seventy years old.



the country's ability to raise incomes and living standards and to create a more inclusive and equitable society. Myanmar's government, development partners such as the World Bank, Asian Development Bank (ADB), the Japan International Cooperation Agency (JICA) and others are allocating substantial resources to support the design and development of a coherent and viable national electrification plan and energy development strategy. At the same time foreign leaders, executives, investors and other parties crowd Yangon and Naypyitaw to position themselves for this major infrastructure upgrade, and to partake in the decades of strong growth forecast in Myanmar moving forward.

effected by power generation. So is

No single solution

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A variety of geographic, economic, social, political and demographic characteristics influence choices regarding optimal primary, secondary and often hybrid and multidimensional electricity solutions. For example, a village may be lucky to be in a politically important area, such as Kyaukpyu and benefit from a government-led electrification initiative, while another may be just outside the reach of the grid extension mandate or located on an island or other difficult terrain that makes grid connection unfeasible. Another village may have the money collectively to connect to the grid but lack the leadership and cohesiveness needed to organize and meet the 24 conditions for grid connection, or vice versa.

These differences must be addressed in conjunction with the availability of physical and financial resources and relevant time factors. While hybrid solutions were not explicitly addressed in the comparative cost calculations included in this study, given the immense additional complexity it would entail, village-level recommendations did in some cases include such recommendations. The most notable example is the suggested use of solar as an auxiliary source to supplement small diesel micro-grids and/or to provide occasional backup and relief from the high cost of diesel.

Optimal and feasible

While steps need to be taken to advance rural electrification beyond installation of the least expensive

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generators, gasifiers and solar panels with no regard to quality, life-span or environmental concerns, one must also acknowledge the realities that exist in rural villages, and seek incremental and feasible improvements. That is one of the lessons of the Chaungthar hybrid facility, where cutting-edge technology was installed without sufficient attention to the ability of local caretakers to provide adequate operational and maintenance care.

In other cases, project lifecycle costs may dictate a choice of solar or gasification but a lack of financing options prevents installation of these technologies over generators, which have lower initial costs but, with the price of fuel and O&M, prove more costly over the long term. That said, in terms of policies and guidance, it would appear best to promote progressive incremental improvement as well as knowledge dissemination. This is why the cost analysis conducted uses incrementally higher quality solar panels and equipment than what is commonly used in Myanmar, as the lower quality commonly found, requires lower up-front investment, but proves more expensive over the long term.

Financing and regulations

From a technical standpoint, achieving universal electrification in Myanmar is fairly straight-forward. With the development of the National Electrification Plan, consensus is emerging over the promotion of national grid extension to most of the nation by 2030. It also suggests auxiliary movement to utilize solar and other renewable technologies to provide interim power to rural and other areas that are either beyond the reach of the grid or which will be electrified in later stages. Financing these plans, however, will prove challenging.

While the country has a significant number of talented engineers, it is lacking in financial analysts, economists and the bankers who could help structure projects in a way that would be financially viable from the standpoint of foreign investors. Further, as yet there is no clarity whether funding for grid extension plans will come from grants, loans, rate increases or other sources. These financial challenges must be addressed as part of the broader electrification plans for Myanmar.

In the rush to add capacity, substantial attention is being devoted to development of new projects and installations in both urban and rural areas. Planning and funding these projects will require extensive engineering and financial resources. At the same time there is seemingly little effort being placed on the development of mechanisms to teach villagers how to better maintain and operate facilities that are already in place. This would help to reduce losses and ensure equipment remains operational and efficient over its maximum life span. Likewise some analysts believe simply replacing existing generators with more modern equipment could potentially double power output generated from the current energy supply. While transmission losses, partially due to antiquated power lines, stand at about 20%.

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Upgrades and efficiency measures do not need to depend upon outside sources. To date, there has not been a thorough evaluation of Myanmar's in-country capacity to support electrification, including the manufacturing of engines, solar cells, boilers, pipework, instrumentation, cable, insulators, switchgear, transformers, and other equipment. Such manufacturing, in addition to benefiting electricity development and efficiency, can also play a role in creating jobs and boosting Myanmar' overall economy.

Myanmar lacks adequate regulations and standards, environmental and otherwise, as well as an ability to monitor and enforce adherence. This has negative consequences as it impinges on the development of a coherent and integrated system and the ability of the government to introduce incentives that encourage efficiencies and the use of technologies, such as gasification, which are potentially advantageous but create risks as toxic waste and other undesirable outputs are introduced into the environment.

Even where standards do exist, as with those developed by the Myanmar Engineering Society, they are implemented on a voluntary basis. As a result, there is little provision for enforcement and oversight. In addition to ensuring greater health and safety, such regulatory provisions and guidelines and enforcement are necessary to encourage investment in the sector.

Public-private convergence

It is critically important for the public and private sectors, both domestic and foreign, to work together to successfully develop policies that reward and facilitate private participation in the electricity sector. This includes Myanmar lacks adequate regulations and standards, environmental and otherwise, as well as an ability to monitor and enforce adherence.



independent power provision and power purchase agreements.

In addition to clarifying legislation on these issues, adjustments may also be made to tariffs, microfinance laws, and other regulation to encourage a market-oriented approach that is less dependent on government directives. Passage of a Rural Electrification Act is also vital. There is also a need for public and private actors to engage in dialogue to minimize duplication of efforts and to facilitate the development of public-private partnerships.

Toward this end, stakeholder meetings, such as those organized as part of this initiative, which bring together government officials, private sector leaders and other energy and electrification experts, should be expanded and continued. Myanmar must carefully consider its options as it determines future policies and plans to meet growing demand for electricity while balancing a mix of reliable and sustainable energy technologies and sources.

Universal electrification through grid extension is the long-term goal for Myanmar, as envisioned by the World Bank and ADB. In the shortterm, off-grid solutions are also needed and must account for the possibility of eventually connecting off-grid sources to the grid system. Off-grid initiatives should also consider that certain villages, due to geographic or financial constraints, may not be able to economically connect to the national grid for the foreseeable future and thus require alternatives that are reliable, affordable and sustainable over the long-term. This is also one of the drivers why adoption of a Rural Electrification Act that can offer incentives and a structure to facilitate electrification activity on the village level. *This article is excerpted from a* comprehensive report prepared by KWR International & ERIA

Myanmar power demand to 2030



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