

ACCESS TO ENERGY, CHALLENGES AND OPPORTUNITIES: THE PNG CASE

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Overview

Papua New Guinea's (PNG) energy situation is characterised primarily by a high reliance on imported fuels. Of the total supply, crude oil and petroleum products maintained the largest share in 2015 (49%), although this was more than a 30% reduction from the 2014 level (72%). Gas was the second-largest fuel source and its share increased to 39% in 2015 from just 10% in 2014. The remaining share (12%) was attributed to other energy sources such as hydro and renewables (EGEDA, 2017).

Around eighty-seven per cent of Papua New Guinea's (PNG) approximately eight million people live in the rural areas represented by a diverse and highly fragmented population with over 800 distinct languages. Population densities outside of major urban centres and the Highlands area are very low although if access to and use of arable land is considered actual densities are quite high. Even though PNG has experienced very high per capita growth rates in excess of 8% for a number of years now, the benefits are not very widespread as of yet and PNG has poverty rates in excess of 30% (APERC, 2017).

As of 2010, access to electricity is available to slightly over 13% of all households mainly in urban areas while the majority of the population who live in highly spread out locations do not have any access to electricity. Access to electricity is seen as a basic social need and an important driver of development to improve living standards as a basic social need. Women and children are particularly disadvantaged by this very low access, as electricity is seen as critical for complementing basic education needs and providing competent health facilities. The PNG Government recognises this as a major development priority and is one of the objectives of the Vision 2050 development plan (APERC, 2017).

In August 2017, the Asia Pacific Energy Research Centre (APERC) team together with some of the experts from APEC member economies, conducted a peer review on low carbon supply in PNG to review and discuss its low carbon energy policies and programs with representatives and experts from different lines of government ministries, academic institutions and energy companies of PNG. In that peer review, several challenges on energy access were also identified by the team. With this background, this paper will try to assess what kind of issues or challenges that needs to be addressed first to achieve or improve energy access in PNG.

Methods

Assessment of some of the challenges identified relating to energy access from the peer review on low carbon energy policies in PNG. From these challenges a number of opportunities were formulated. The final report on PRLCE in PNG was used as a reference on the challenges, opportunities and recommendations cited in this paper.

Results

Challenge (1) *Highly ambitious target to reach 2 500 electric generating capacity by 2050*— Whether this level is appropriate depends on macroeconomic variables such as population and economic development, as well as electric system variables, such as capacity factor and technical losses.

Opportunity: *PNG should analyse latent demand for electricity so that capital-intensive energy infrastructure investments can be optimised to meet customer needs in non-electrified areas.* To avoid overbuilding the electric system at the expense of other capital-intensive projects important to PNG, the capacity expansion of the electric system should be estimated with caution and consideration of all relevant factors. Compared with peers in Asia and Africa, the 2 500 MW estimate might provide much more electricity than needed for PNG's demand. If population grows at 2.5% each year to 2030, and assuming the 70% electrification goal is met, then PNG will need to supply electricity to approximately 7.7 million people. A better understanding of the assumptions used in reaching the 2 500 MW estimate would help determine whether that level of capacity is an appropriate infrastructure planning goal.

Challenge (2) *Poor public attitude and perception*- As PNG's rural communities face multiple pressing needs (e.g. water supply, sanitation, road building, health issues, education, economic development etc.), electricity may have

been undervalued. This causes a misalignment with the government's objectives for increasing electricity access and may hence impede wider developments.

Opportunity: *Mapping the people needs*—Electricity becomes valuable when it powers equipment that improves the productivity or quality of life of those with access to it. An electrification programme may be more impactful if it is linked with well-articulated purposes, such as access to health services, remote education or agricultural marketing. This would enable engineering solutions tailored to the electricity access needs in different communities, balancing the cost of providing access with the expected benefit. There are quite a number of similar opportunities relating to mapping the people needs in order to address this challenge, such as but not limited to 1) conducting survey, 2) taking one step at a time, and 3) education and public education/awareness raising.

Challenge (3) Shortage on manpower, capacity and skills for expanding energy access —One of the low hanging fruits is for the government to devote more resources, both technical and financial, to enhance the capacity of agencies in implementing policies or action plans to its relevant stakeholders playing important roles in the energy sector.

Opportunity: *Training needs assessment*— Assess the requirements of its workforce and review the need for training across the board, including knowledge transfer from foreign investors to the locals. As foreign companies operate most of the energy infrastructure in PNG, it would be beneficial for PNG if knowledge transfer from these foreign companies could form part of the contract or agreement.

Challenge (4): High cost of infrastructure—Private capital tends to flow to electric systems with predictable sources of revenue, a stable number of customers, and timely payments from large users, including government customers. Increasing rural access can be costly and logistically challenging, and present uncertain returns in the face of competing infrastructure priorities.

Opportunity: *PNG should focus attention and resources on a near-term action plan to develop the lowest cost renewable resource available near load centres*—PNG is blessed with a variety of energy resources. It is understood that PNG has a full range of potential energy resources. While resources such as ocean thermal or geothermal may benefit PNG in the future, presently available commercial technology at relatively low costs can improve quality of life in PNG in the near term. Given the social and institutional issues mentioned here, focusing on a few priority projects may result in the biggest impact, making the most of both donor funds and PNG government expertise. Channelling efforts and resources towards success in one or two areas can be the foundation for success in other areas.

Conclusions

Given the current low starting point and PNG's economic conditions, increasing access to energy is overly challenging. But, blessed with a good geographical location and a wealth of natural resources, PNG has immense potential to tap on the full range of renewable energy options, especially in the rural areas, that can help achieve quality universal access, and not just energy access.

Much of the needed groundwork has already been laid for a supportive policy environment, enabling the newly-elected government to quickly set priorities for the development of the electricity system in PNG. While a number of energy policies has since been developed to work towards the targets, stronger government commitment is necessary to drive these draft policies to implementation.

References

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