

POLICY BRIEF



ASSESSMENT OF THE ECONOMIC COSTS OF ELECTRICAL POWER OUTAGES IN SWAZILAND

Key Message

Electricity access has improved significantly since introduction of the National Energy Policy of 2003. However, challenges in electricity supply still exist due to the frequency of interruptions, which has resulted in harsh penalties and costs to the economy. In 2016, power outages cost Swaziland E700 million in nominal monetary terms, representing 1.67% of Swaziland's Gross Domestic Product (GDP). If not addressed, the problems with the electricity sector will severely undermine the government's effort to improve the development of the country. In essence, the benefits of increased access to the electricity grid will not be realised if power supply is as unreliable as it currently is. Considerable effort should be made to ensure that the country's electricity supply system is stable and uninterrupted. Hence, in order to achieve this, there is need for policy attention towards improving the energy sector through investments in electricity generation using renewable energy sources, expediting the promotion of decentralised electricity generation to vulnerable areas, and setting stringent standards for the generation and distribution of electricity.

What is the issue?

The National Development Strategy (NDS) has positioned the energy sector as a central vehicle for achieving socioeconomic development in Swaziland. As a result, there have been massive investments by the government to increase access to electricity for the citizenry. However, studies show that for an economy to achieve all the benefits of electricity, access alone is not enough; it should be reliable and of good quality.

Swaziland experiences problems in its energy sector. Some of the challenges identified by the Swaziland Energy Policy (2003) include the unreliability of electricity supply, which often experiences interruptions (Government of Swaziland, 2003). Electricity interruptions have been increasing in recent years at the back of an increasing energy demand for the country (World Bank, 2015; Government of Swaziland, 2014). Factors which contribute to the issues of power supply unreliability include poor weather conditions with excessive lightening, a weak power grid with little to no reserve capacity, and a heavy reliance on energy imported from South Africa, which has pressured the country to reduce consumption by at least 5% (Government of Swaziland, 2003; Government of Swaziland, 2014). Independent scholars, such as Dlamini (2012), also cite technical inefficiencies in power delivery mechanisms by the Swaziland Electricity Company (SEC) as a contributing factor to power supply unreliability in the country.

Against this backdrop, and notwithstanding the fact that there have been substantial investments by the government to improve access to electricity, the energy sector is failing to take-off and catalyse the much needed economic growth in the country, which has resulted in costs to the economy that have not yet been quantified. In order to provide possible policy solutions to reduce the power supply unreliability issues currently faced by the country, this study estimates the economic costs of supply interruptions. Attaching a monetary value to power interruptions gives policymakers an idea of what the country stands to lose due to an unstable/unreliable power supply system. The study also recommends possible solutions towards achieving a robust energy sector in Swaziland.

Why does estimating economic costs of power outages matter?

Measuring the economic costs of power outages underscores the importance of putting forward measures to ensure the reliability of energy supply in Swaziland. The Sustainable Energy for All Rapid Assessment, Gap Analysis and Country Action Plan of Swaziland (2014) states that there is a lack of consumer energy research in the country and yet such research plays a crucial role in informing energy improvement strategies. By beginning to bridge this research gap, a study on the costs of power outages on its users becomes an essential and necessary step towards the developing evidence-based action on energy security action plans, policies, and strategies in Swaziland.

How was the study conducted?

Customer surveys have been the most preferred method to estimate the cost of power interruptions as it provides more accurate and sufficient costs of power outages data for planning purposes, especially in cases where there is insufficient country level data to estimate the costs (Kufeoglu, 2015).

To estimate the economic costs of power outages, the survey method was adopted; 453 residential and 83 business interviews were conducted in May 2017. The approach used to estimate the economic costs of power outages in Swaziland draws from Kaseke (2011), who used the Direct Worth (DW) method to estimate the economic costs of power outages in Zimbabwe. The Direct Worth approach (DW) entails asking a customer on the economic losses that resulted from power interruptions (Kufeoglu, 2015). The nature of costs can include spoilage of raw material, loss of output, damage to equipment, unengaged labour, and so forth.

To estimate the economic costs of power outages (economic problem), consideration must be taken of the effect of power outages on GDP and the affected sectors of the economy. In order to identify the most vulnerable groups in terms of total costs of power outages, the costs were cross-tabulated according to the different locational, regional and business sectors to determine whether their costs varied and hence identify the vulnerable area, region and business sector which is mostly affected by power interruptions.

To assess strategies for improving supply service, the study complemented the DW method with the Contingent Valuation Method (CVM) to ascertain willingness to pay (WTP) for improved electricity supply. The study also sought to find out the possible factors that may influence a household's WTP for improved electricity supply.

What did the study find?

The study found that the costs of power outages on the residential sector amount to 1.67% of Swaziland’s GDP. Amongst locational areas, rural areas proved to be the most impacted by power outages because they reported the highest direct costs, which were 57.5% of the total direct costs incurred by the residential sector. Regionally, the economic costs of power outages revealed that Lubombo reported the highest direct costs, which were 30% of the total direct costs incurred by the residential sector. This can be attributed to the fact that rural areas experience longer durations of power outages compared to urban areas. Moreover, regionally this could be because Lubombo experiences longer durations of power outages compared to the other regions, as shown in Table 1.

Table 1: Average Duration of Power Outages

Location	Average Duration of Power Outage (Hours)
Hhohho	9.37
Manzini	12.02
Shiselweni	10.48
Lubombo	22.3
Rural	14.62
Urban	5.3

Source: Survey (2017)

In terms of WTP, 68.7% of the households were not willing to pay for improved electricity service. The 31.3% of households willing to pay for improved electricity service were prepared to pay on average, a percentage tariff increase of 2.42% in winter and 2.73% in summer. The study identified the frequency of power outages, maintenance cost of back-up equipment, and possession of back-up equipment as factors that increase a household’s WTP for improved service, whilst the perception of the current price of electricity has a negative relationship with the household’s WTP.

Specifically, this means that as the weekly frequency of power outages experienced by the household increase, the more likely they will be willing to pay for improved electricity service compared to households that experience lower incidences of power outages. Moreover, households that invest in back-up equipment are those that really require reliable electricity and can afford it; however, they are more willing to pay for uninterrupted power supply because the use of back-up equipment is more expensive. Additionally, as the households’ maintenance costs for back-up equipment increase, the more likely they will be willing to pay for uninterrupted electricity supply. Lastly, as the households’ perception of the price of the current electricity supply changes - that is, from too low to too high – they are more likely not willing to pay for improved service compared to those who are of the view that the price of electricity is too low or satisfactory.

Under the business sector, the industrial sector reported the highest direct costs compared to the others. The costs reported by the industrial sector were 70.91% (E19,124,110) of the total direct costs incurred by the business sector (E26,970,915.20), which shows that it is the most affected by power interruptions. The costs reported by the commercial and agricultural sectors were 16.03% and 13.07% respectively, both significantly lower compared to the industrial sector. Industry constitutes major SEC customers who stand to lose a lot from power interruptions. Costs to major customers were almost two-thirds (2/3) of the total business sector costs.

Moreover, electrical power outages in the business sector have resulted in many consequences, including the loss of raw material, output loss, damage to equipment, material destruction, restart costs, idle productive time of unengaged workers, and high costs of investing in back-up equipment to keep the businesses going. This has adverse implications on development for the country. The loss of output reduces company profits and total output produced in the country, resulting in GDP not growing as expected. This becomes a deterrence to Foreign Direct Investment (FDI) as companies may be forced to relocate to more power-stable countries leaving the industrial hub in the country empty.

Recommendations

The main intervention for the electricity issues currently faced by Swaziland is substantial investment into the country's generation capacity and for the regulatory authority to apply stringent measures to ensure the reliability of power supply. Therefore, based on the results, this study recommends the following:

- Invest in own generation of electricity using one of Swaziland's most abundant resources: solar energy. The Sustainable Energy for All Action Plan of 2014 states that solar radiation is abundant in the country, with the best potential towards the South East (Government of Swaziland, 2014).
- Diversify electricity imports other than solely relying on South Africa, which currently faces issues in the energy sector. There is evidence that there is cheap generation in countries such as Zambia, Mozambique, and Tanzania, which are all part of the Southern African Power Pool (SAPP).
- Expedite the establishment of mini-grids in the rural areas in order to alleviate the problems experienced by the vulnerable location areas in terms of electric power.
- Set up customer compensation schemes whereby a customer is compensated for facing prolonged power interruption over and above a certain acceptable period (which could be determined by the regulatory authority) in order to increase the standards of service for electricity customers.
- Expedite the implementation of a tariff differentiation strategy between low and high-income groups.

References

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