Opinion

Electricity for health, productivity

By Dr Bjorn Lomborg

EXPANDING access to electricity can increase productivity and even improve health access, which makes it a vital component of development in rural areas. However, electricity access in rural Ghana was only 67 per cent in 2018, and the northern parts of the country are in a notably worse situation compared to regions in the south.

In all three northern regions, national grid connection is less than 70 per cent, due to most communities being located far from major voltage lines and having low population densities. These areas are also more difficult to access due to poor road infrastructure and difficult terrain.

To bridge the gap and provide electricity to Ghana's rural population, a combination of energy solutions is required.

These initiatives could involve the use of both renewable and non-renewable sources of energy through grid extensions and local off-grid solutions, but decision-makers need to ensure the investment goes to the best possible policies.

With so many areas demanding urgent attention, how can the government determine the best course of action in every situation?

Ghana Priorities

Ghana Priorities, a collaboration between the National Development Planning Commission (NDPC) and the award-winning think tank Copenhagen Consensus, aims to answer this question and provide the smartest solutions for the country.

Over the course of last year, 28 teams of economists working on this project examined the costs and benefits of over 80 interventions to find which would do the most good for every cedi spent in economic, social and environmental terms.

Francis Kemausuor, Kwaku Amaning Adjei, John Bosco Dramani, and Prince Boakye Frimpong from the Kwame Nkrumah University of Science and Technology (KNUST), and Brad Wong of the Copenhagen Consensus studied interventions to improve access to electricity in rural Ghana, using the well-representative Gushiegu Municipality of the Northern Region as a model.

The initiatives include the expansion of the national grid to less-remote communities, the use of solar and diesel micro-grids in small, remote communities and finally, broadening access to the national grid to all remaining, small communities.

Expanding the grid to the 79 less-remote communities would reach approximately 42,000 people or around 7,000 households in eight years.

The researchers estimated the cost of connecting these communities at GH¢ 59 million and the total cost, including electricity generation over 20 years, at around GH¢ 100 million.

The result would be a 46 per cent increase in gross household income through increased productivity.

Electrification would also incentivise health care workers to move to rural communities and increase the availability of services, leading to a 35 per cent reduction in hospitalisations and one avoided death per every 4,500 individuals each year.

In total, extending the national grid to less-remote communities would amount to benefits worth GH¢ 450 million in increased productivity and health, or 4.5 times the cost of the original investment.

Micro grid

For small and remote communities, the researchers studied the option of a micro-grid, diesel or solar-powered, to generate and distribute electricity to a limited number of customers in isolation from national networks.

Diesel micro-grids, at approximately GH¢ 25,000 per household, are slightly more expensive than solar micro-grids, at GH¢ 20,000.

However, they can also bring in higher benefits for each household, at GH¢ 45,000 over the GH¢ 34,000 of a solar grid connection.

The researchers considered the total cost of 300 households being connected to diesel micro-grids by 2027, at GH¢ 7.6 million.

For solar-powered grids, the analysis included 1911 households, for a cost of GH¢ 38 million.

The expected benefits in increased welfare and household income from the connection to a diesel micro-grid are 13.6 million, meaning every cedi invested in this initiative can yield a return of GHC 1.8.

With solar-powered grids, the benefits are GH¢ 65 million, which takes the cost-benefit ratio to 1.7, slightly lower than diesel.

Expansion

As an alternative to micro-grids, the researchers studied the possible expansion of the national grid to all remote communities of over 200 people in the municipality.

The total costs were estimated at GH¢ 83 million for 2,493 households, and the benefits at GH¢ 92 million.

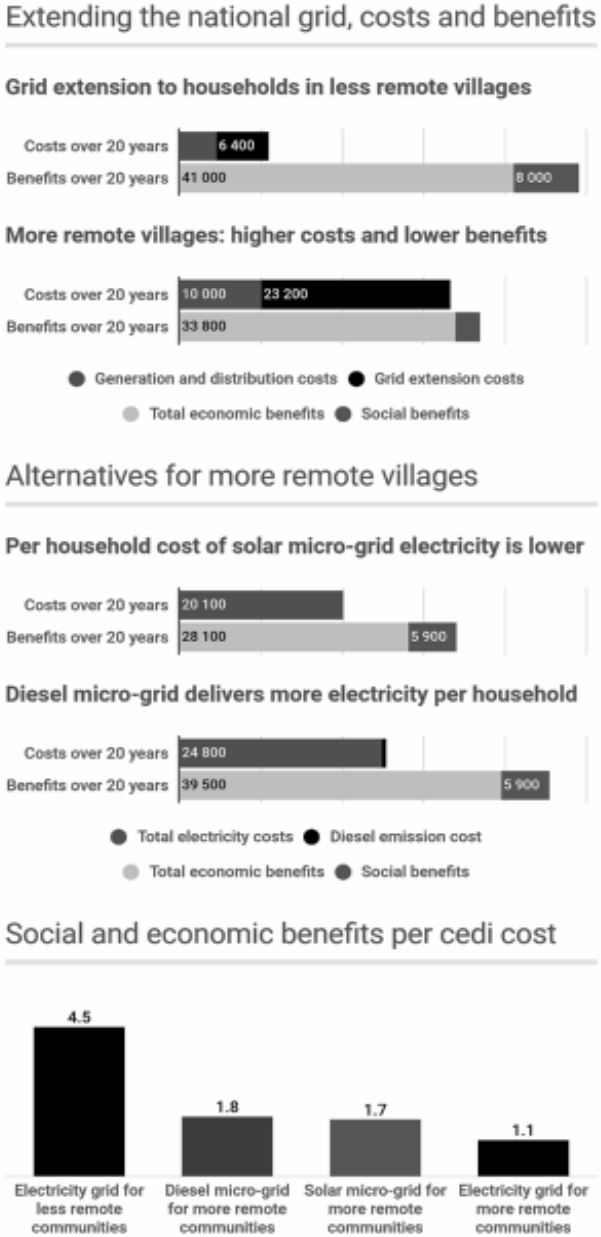
The cost-benefit ratio of this intervention is 1.1, showing that for households in more remote communities, providing solar and diesel micro-grids yields slightly higher benefits than connecting them to the national grid.

If policymakers consider electrification as a must-have for Ghana's rural population, this cost-benefit analysis suggests that micro-grids are the best bet in remote areas.

In the rural communities that are closer to the existing infrastructure and have a higher electricity demand, connecting them to the national grid is the most cost-effective solution.

All these interventions pass the cost-benefit test and would undoubtedly improve the health and development of remote rural communities in the northern regions of Ghana.

The writer is the President of the Copenhagen Consensus & Visiting Professor at Copenhagen Business School.



Source: Authors paper assuming 8% discount rate