



Centre for Energy, Petroleum
and Mineral Law and Policy
University of Dundee

**Notes from the Webinar
'Renewable Energy for Resilient
Health Systems in Nigeria'; Thursday
5 August 2021, 11 am – 12.45 noon**

**UK-Nigeria collaboration
University of Dundee (UK), Covenant
University (Nigeria) &
The Rural Electrification Agency
(Nigeria)**

Supported by



UK Research
and Innovation



Scottish Funding Council
Comhairle Maoinneachaidh na h-Alba



Webinar Notes

The Webinar was chaired by Dr Maria Augusta Paim, and introduced by Professor Volker Roeben and Dr Xiaoyi Mu, both from the Centre for Energy, Petroleum and Mineral Law and Policy - CEPMLP. Professor Volker Roeben has noted the importance of the project to understand the critical challenge of renewable energy investments for a resilient health sector in Nigeria, particularly their sustainability in the long run. In his views, this challenge needs to be addressed by the global community, and despite the focus in Nigeria, the webinar's topic is relevant for all countries in Africa and the developing world.

The introduction was followed by the talks, summarised below:

- **Dr Obindah Gershon** (Covenant University, Centre for Economic Policy and Development Research -CEPDeR) ***Bankable business models for sustainably powering Primary Health Centres (PHCs)***: PHCs are effective channels for delivering cost-effective, efficient, quality, accessible and affordable health services to a vast proportion of the population in Nigeria. Funding for powering PHCs in the federal capital is meagre. PHCs do not generate enough revenues (from the services rendered to patients) to pay for energy services and recurrent expenditures. The problem can be summarised as follows: (i) PHCs lack the initial capital investment of solar power; (ii) PHCs need regular funding to maintain existing solar power facilities; and (iii) PHCs need sustainable energy for delivering essential healthcare services to low-income consumers.

Making budgetary provisions for defraying electricity tariffs and other utility charges does not mean money is being released or available at the facility level. For example, in 2017, only 10% of the total fuel and lubrication in PHCs allocation budget in the federal capital was made available.

Some of the bankable models include the maintenance of funds simultaneously with the installation of solar panels. The PHCs could tap from the funds available under the Power Consumer Assistance Fund (described in part VII of the Electric Power sector act of 2005) to subsidise underprivileged power consumers as specified by the Minister of Power as stipulated by S.83 (1 and 4). A healthcare electrification unit within the Rural Electrification Agency (REA) could be created. PHC Development Agency/Boards (in collaboration with the REA) may have to manage the prepayment of funds to maintain solar PVs. The investor could benefit from a 50% tax waiver, 100% tax concession or 100% concession spread over five years.

- **Dr Adebola Adeyemi** (partner at PAC Solicitors) ***Assessing Commercial Considerations and Incentives for RE Generation in Nigeria***: The power sector in Nigeria continues to evolve with regulations, policies, road maps and technical standards. Despite the abundance of renewable energy resources, Nigeria is one of the top three countries with an energy deficit of around 90 million unserved people. Loans from international financing organisations are the main strategy and appear to be the most cost-effective way. For example, PowerGen has recently secured long-term financing from CrossBoundary Energy to develop distributed solar energy systems. International financial institutions and the REA provide a grant for each customer to be connected through the Nigeria Electrification Project. While CrossBoundary will acquire the solar panels that meet technical standards, PowerGen will continue operating and maintaining the power structure. Such arrangement allows the efficient allocation of risks between the construction and operation phase among the financiers and the operators.

Financial incentives include public support schemes, such as subsidies directed at Capex and Opex. Another option is to reconsider the import duty waiver for installation costs (5% on solar panels plus VAT and up to 20% on batteries).

Certain inhibiting factors of renewable energy adoption in Nigeria include the risk of investments returns due to currency fluctuations/exchange rate policy uncertainty. Additionally, there is not enough regulatory certainty and clarity about how future energy demand will impact investment. However, technology can enable alternative investment sources, collection of services payments, and data availability and access. For instance, crowdfunding platforms can support responsible investment in the health sector. In 2021, the Securities Exchange Commission in Nigeria issued the rules governing crowdfunding in Nigeria.

After the talks, the panel of experts discussed the nexus of renewable energy and health both in Nigeria and internationally. The main points discussed are summarised as follows:

- **Dr Sanusi Ohiare** (Rural Electrification Funds - REF, and REA Board Member, Nigeria): When the COVID-19 outbreak started, the REA acted quickly to implement a few isolations health centres. The most successful business models have involved building such centres within large tertiary institutions like university teaching hospitals. They have better sources of subvention or revenue than the health centres, hence, they can be responsible for the operation and maintenance of the systems during the lifespan of the project.

PHCs are very small centres, normally in rural areas, which are unserved in terms of energy access. They lack revenue, and they usually don't get the all the money allocated for them in the budget. It is a huge challenge, but the REA understood that it needed to start something. That is why I am happy to have this type of conversation; it is from conversations like this that the options begin to emerge, maybe leading to policy developments around the subject that could eventually create sustainable electricity access. The National Health Development Agency has provided data for the REA to select PHCs for electrification, prioritizing the viable ones, i.e., productive units in regular location, with in-house doctors and nurses. However, most of the PHCs were dilapidated and without regular staff, or locked-up. The REA needed to check the facilities to be sure the investments would not be wasted where the power will not be used. In other cases, the capacity of the small systems (5kW hybrid with batteries and diesel generator) was even higher than the energy demand of the PHCs, because they did not have much equipment for powering. In some occasions, the diesel generator become targets for thieves.

In some of the business models, operation and maintenance is covered for the period of at least three years, but the key question is what happen after this period. I think a viable option is for instance, to include the PHCs in oversized systems. The PHCs have small stature and are built within communities that could eventually buy the excess power of the PHCs, helping them to operate and maintain the energy systems. This model is already happening in some areas particularly in the South. Another option is to build mini grids for communities and then integrating PHCs and other public institutions in the system that is already functioning. But the REA has noticed that the issue of viability of PHCs is more difficult to access than, for instance, in the case of education or residential projects. Ultimately these are discussions around finance for long-run sustainability; and all options are on the table to be discussed with the government.

- **Mr Luc Severi** (Sustainable Energy for All - SEforALL): When we look at health facilities electrification problem (i.e., many of them being un-electrified, under-electrified or unreliably electrified) under the short-term versus the long-term perspectives, we are considering financial aspects such as Capex (capital expenditure: investment needed today in the renewable energy solution) and Opex (operating expenses: money that is needed over time, to keep everything running). There is no such thing as zero maintenance. Everything will require at least a bit of maintenance, such as regular cleaning of the solar panels, tightening of cables, and replacing fuses. We are not talking about something new, like putting solar panels in clinics, as the sector has been

doing this for three decades and can now take advantage of the recent massive cost reduction. The systems are no longer products and involve hardware and software that need to work adequately and timely. For instance, when multiple loads are in one system, the programming must consider load prioritisation (e.g., the delivery room over the staff quarters).

There are too many stranded assets on the health facilities; it is easy to find health facilities with small PV solutions that no longer function. Typically, we have a graveyard of solar panels because it has been challenging to focus on maintenance. It is one thing to put down a solution, find a provider, procure goods and install them, and find the funding for it, usually from grants from donors, NGOs or the public sector. However, it is the maintenance that ensures the system working in the long term. At some point, they will fail, but we need to make sure that this happens they have reached their end of life, and not because of a lack of budget or technical skills. The design of these interventions needs to make sure there will be ample resources available to cover the long-term operation and maintenance.

These resources comprise both financial and human, as money is necessary when needed to be disbursed and having the people with the right skills to make sure the system is operating well. The health facilities are generally understaffed, and many of them are staffed by doctors, midwives, nurses, none of whom should be made responsible for the solar PV solution. That is why the involvement of the private sector is so significant. They have tremendous experience in rural households' electrification and can service these clinics more efficiently and cost-effectively. The risk is how to get the private sector involved? How can they see this as an opportunity? Some solar PV business models are exploring services-based approaches. In the case of rural electrification for social purposes, it is quite tricky because it is unclear who is the customer, what is the ability to pay, what are the risks and which party should take on which risks. There are multiple parties involved: federal, states, districts, the actual clinic, donors, investors, service providers. The risks must be managed appropriately and divided proportionally for the community at large. Since this does not happen automatically, it is unrealistic to expect the private sector to jump on this opportunity and accept all the risks for the next ten years to electrify the health facility understaffed and under-funded.

To conclude, there are two pillars for the sector to continue to invest in, which could help us further along, whether at the country level or the international level. The first pillar is data. We still don't know enough about where all these clinics are, especially what their electrification status is, which is a tricky situation: you may want to electrify 400 clinics, but you don't know where they are, you don't know what they already have, which appliances they have, it makes things complicated; it causes a lot of delays in project development. Two years ago, I would have said we need to invest in impact data to convince health Ministries and donors that rural electrification, reliable power saves lives. I think COVID-19 made that case for us. In that sense, we need to take advantage of this pandemic, of the momentum that COVID-19 has created, through the appliance applications that we had with ventilators, water and sanitation or cold chain and making sure vaccines can be distributed and stored. But we need to take advantage of this momentum to drive to the point of action based on the first point of data and the second point of coordination. These types of conversations are critical to making sure that this is an intersectoral problem. It requires an intersectoral solution.

To finish with two more dynamic matrices: on the one hand, we need to build bridges with energy and health because this is not an energy problem; this is not a health problem. It is an energy problem in the health sector. On the other hand, we need the health actors to be as present and actively involved as the energy actors. Similarly, public versus private; this is not something we will exclusively solve in the public sector. This is not something that the private sector will solve all by

themselves, given the risks and difficulties involved. So, these are my final two points: (i) let's invest in data; (ii) make sure that everybody knows where we are and have started from the same page; and (iii) keep exchanging and sharing.

Whether we approach this from the health, the energy or a gender lens, we need to make sure that we collaborate, reach across the aisle, and solve this in an intersectoral way.

- **Mr Ali Yasir** (International Renewable Energy Agency – IRENA): IRENA is finalizing an assessment of electrification for health facilities in Burkina Faso. We start to speak with agencies that could potentially finance such a development, and immediately, the first question came: Do we know how big the problem is? Do we know how many health facilities need electrification? So, IRENA started to support its members to develop a comprehensive country assessment to obtain data identifying how many health facilities need electrification, the gaps across the ecosystem, policy regulation, and aspects related to technology, design, training, skills, finance, and operation. The starting point for anything is to understand the challenges and the resources that would be needed, both human and financial resources.

This point connects very well with the issue of the involvement of health actors. The Ministry of Energy has sent us a list of around 300 under electrified facilities. However, when we involved the Ministry of Health in the discussion, we learned that the requirements were not only in these 300 un-electrified health facilities, but around 400 plus were non-functioning, and around 700 had solar systems that only cater to limited needs. Also, several health facilities that are served by the grid have serious reliability issues. More importantly, when we heard the health actors, it is critical to understand what are the challenges that PHCs are facing (i.e., child and maternal care, COVID-19 prevention and management, gastroenterology diseases, infection, malaria, virus), and how can they be alleviated through the energy access.

The energy needs must be estimated in line with what is needed by the health system. And sometimes, this is not a simple case of what is the actual demand. For example, the health facility may not be fully equipped, and the mere demand calculation will give a different figure. But understanding what is needed and if there might be more equipment that the health facility will be trying to acquire will result in what is precisely required. So, it is critical to have onboard both the energy and health sides, understand the real need, and then design the energy system accordingly.

It is also essential to look at the country context. We could argue that countries with a lack of access to electricity have a much bigger need for healthcare electrification. But for example, in small islands cases where there is maybe better electrification, those systems are vulnerable due to climate and weather extremes. For this reason, decentralized solutions based on solar panels are relevant in the islands' context, even if the electrification grid could be promising.

I completely agree that there is a real need to have more private sector-centric approaches, particularly on the delivery side, but that doesn't necessarily mean these projects have to be deployed in very commercially. For example, the ownership of the systems could still be at the public level. But for long-term contracts with operation and management, there is a clear role for the private sector that is undoubtedly one way to go forward, including public-private partnerships.