



Let's make solar work

A Nigerian-German Initiative

International Energy Transition Consultant, Oliver Drücke adopts Germany's 'the whole is bigger than the sum of its parts' ethos to encourage collaborative energy solutions in Nigeria - Africa's most populated, but one of its least efficient countries

By Oliver Drücke, Project Director, "Let's make solar work" for SOLAR25 GmbH and International Energy Transition Consultant

Most of Nigeria's industry and critical infrastructures in both urban and remote areas suffer from unreliable grid power supply and poor power quality. To provide some autonomy from the instabilities of the grid, diesel generators are widely used, which is an expensive and unsustainable solution to provide electricity. Meanwhile, the erosion of international oil prices since 2014 has accelerated the domestic energy crisis in Nigeria, as the Government has been forced to cut back on fossil fuel subsidies for its own economy and population. This has led to soaring prices of fossil fuels in the country, resulting in greatly increased costs for all power consumers with their own generators; subsequently reducing operating times of diesel generators and ultimately reducing power availability.

Although fossil fuel-based power generators are widely used, they are unsustainable in many ways. Beside drastically increasing operation costs that have become unforeseeable, they are also loud and emit heavy fumes, resulting in very negative environmental and health impacts. Furthermore, diesel generators are regularly oversized by as much as 50 percent, often resulting in highly inefficient combustion processes. This costs a lot more money spent on power generation than necessary or originally planned. Further disadvantages include overspend on initial investments and replacement investments, avoidable fuel expenditures, downtimes, maintenance personnel and spare parts. The costly diesel-based power system is in fact parasitising Nigeria's economy, hindering its actors to build the future on solid, affordable and thus sustainable fundamentals.

Hostages of failed energy policies
In summary, the overall energy situation in Nigeria is looking shockingly grim to the country's many industrial common people who are working hard every day to feed their families. The obvious power crisis has rightly been qualified as a state of emergency by many leading civil society figures because it hinders the country's population to unlock and develop Nigeria's tremendous economic potential that could so much help modernise the wider African continent. As a result, the demand for alternative power supply technologies which do not rely on expensive fossil fuels as well as solutions to save power, have increased tremendously lately, especially among commercial users. Solar energy, and in particular, photovoltaics (PV) is a great option to generate electricity on-site by harnessing the abundantly available solar resource.

Solar competitiveness just arrived in Nigeria

In recent years, using solar energy has become cheaper than running diesel generators, even in Nigeria. Soaring fossil fuel prices have indeed resulted in a silent revolution where solar power has reached price parity with generator-based power generation in a growing number of geographies. Surprisingly, most Nigerians do not know yet about this major shift and consequently are not fully aware of the specific new competitiveness of solar power. To address this knowledge gap, Let's make solar work just launched the new online "PV-Calculator" on its website, www.letsmakesolarwork.com. The tool compares costs of solar power with the currently existing diesel generation costs for a planned PV project and generates an individual economic approximation for the considered solar investment.

This shift in competitiveness is good news for power consumers, especially for mid-sized power users such as companies and social facilities. It creates a tremendous market potential that will change the paradigm of how power is generated and used in Nigeria. Solar PV will account for most of the expected growth of renewables in the future, in Nigeria, in Africa and



'Let's make solar work' is an initiative of the companies SOLAR23, OneShore Energy, Solarmate Engineering and eclareon. It is co-funded by the German Federal Ministry for Economic Cooperation and Development under the Developppp programme.

worldwide. This was also confirmed by respondents from a survey carried out in Nigeria by the NESP (Nigerian Energy Support Programme).

A survey among mid-sized power users

Recent visits to various mid-sized companies in Lagos by partners of the "Let's make solar work" initiative clearly confirmed their need for alternatives to diesel-based power generation because soaring energy costs are their most acute problem.

"We must fix this issue now," said the owners of Rite Foods, and they were not alone. On their perfectly

managed manufacturing site close to Lagos, Rite Foods is operating a diesel generator capacity of 15 MW. Two alternatives to cut energy costs are within reach: connecting to an announced pipeline bringing natural gas on-site or erecting solar power plants on the large manufacturing halls' roofs and the factory premises.

A survey carried out by the "Let's make solar work" initiative among mid-sized power consumers such as SMEs and social facilities confirmed that the actors have to rely on diesel-generated power more than 75 percent of the time; the rest being provided by an unstable grid with long supply interruptions on a daily basis, even in mega cities such as Lagos. Half of the respondents stated that the costs of energy account for more than 35 percent of their overall operating expenses which is huge compared to European industries where the figure is around five percent on average. Consequently, all interviewed actors without exception are very much interested in cutting their energy costs by whatever means. Almost 40 percent of surveyed actors consider now investing in gas-fired generators, while 34 percent are planning to invest in solar power systems, and only 17 percent in grid connections or extensions.

Solar PV's image

The introduction of solar power in Nigeria stands at its very beginning. Solar systems that have been installed so far are frequently generating counter-references because of quality issues tied to poor engineering, low price and quality equipment, faulty installation, erroneous usage of batteries, as well as weak maintenance procedures and practices. This has consequently contributed to spoiling the image of solar power, thus hampering its acceptance and broader market introduction. Therefore, the supply side still lacks decisive selling

arguments and it can often be heard in Nigeria that "solar doesn't work". This is maybe one reason why none of the surveyed mid-sized industrial, commercial and social actors are using solar power today, although the supply situation with conventional power sources is extremely problematic.

Today, many mid-sized PV projects in Nigeria are falling due to an absence of proper planning process from the suppliers' side as well as from the clients'. The latter often demand PV systems without having a clear understanding of what their power requirements really are. Local EPC companies rarely request a detailed power demand analysis from their clients, nor perform power audits or even load measurements at the clients' premises. Hence, many PV systems are not well dimensioned, planned, installed or operated. Furthermore, the

quality of PV equipment and systems is often poor because the lowest prices tend to drive purchase decisions.

This chicken-egg problem can only be solved by educating the suppliers on the one hand and raising the demand-side's awareness on the other hand. This is where the initiative "Let's make solar work", started by the German-Nigerian solar companies' consortium comes into play.

State-of-the-art solar power knowhow for Nigeria

"Let's make solar work" promotes and supports the market introduction of high-quality PV diesel hybrid systems to mid-sized power consumers, such as small and medium enterprises (SMEs) and social facilities. These actors are the true backbone of the Nigerian economy and they do not only require but deserve access to reliable and

PV-Calculator tool



The online PV-Calculator tool was jointly developed by the project partner, eclareon together with the German non-profit research institute. The costs of tool development were co-funded by the German Federal Ministry for Economic Affairs and Energy and by the German Federal Foreign Office.



affordable power. To tackle the many quality issues mentioned above, Let's make solar work disseminates German know-how to Nigerian energy professionals through training seminars on focused power auditing, advanced power efficiency measures and the use of solar PV-diesel hybrid power supply solutions. The participating professionals are enabled

to systematically advise SMEs and social facilities on suitable solutions for saving energy and for securing a more stable energy supply by simply using solar energy.

Three pilot power audits have recently been carried out in two selected SMEs and one hospital. They serve as good practice examples for solar professionals who develop

medium-sized solar projects by offering focused power audits to their clients. The initiative is co-financed by the German development programme with German public funds and operates a very informative website under www.letsmakesolarwork.com which features the "PV investment calculator" for clients and suppliers and also offers attractive downloads.

Next to two initial training seminars for trainers and solar EPC companies carried out successfully in Lagos at the end of 2017 and another to come before the end of June, 2018, more such training seminars are in preparation with well-established Nigerian vocational training institutes. The goal is to penetrate the topical training contents throughout Nigeria. Furthermore, accompanying dissemination activities spread the knowledge about the initiative and its comprehensive tool offering to all relevant Nigerian stakeholders through targeted media work and via Facebook.

Oliver Drücke



Oliver Drücke has been active since 1990 as an energy transition specialist, market and business developer in Germany, Europe, MENA and Africa, as well as worldwide. He has initiated and participated in many activities that helped shape the energy transition dynamics we see unfolding globally today. Oliver works as an independent international energy transition consultant and also serves as VP for strategy and market development at the German-Turkish EPC company, SOLAR23 which has specialised in African solar markets since 2000.



Raising awareness, determining costs, and finding competent suppliers

Given the initial success of Let's make solar work, the two German Ministries of Foreign Affairs and of Economy and Energy have just been convinced to boost the initiative with more targeted measures on the demand side. In June, 2018, a new online campaign called "Solar works, Save money" will be launched to address SMEs and social facilities such as hospitals, schools, churches and mosques. The centrally featured PV investment calculator enables potential PV users to easily assess the economics of a PV diesel hybrid system investment,

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with indicators such as payback time, LCOE, IRR and NPV. Furthermore, the website lists competent Nigerian solar companies able to carry out a focused power audit, to dimension a customised PV diesel hybrid system and to submit professional offers to their interested clients.

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