



*CREDC-*Newsletter

CREDC-Newsletter is a publication of the Community Research and Development Centre (CREDC).

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From the Editorial Desk

Dear Readers,

The Community Research and Development Centre (CREDC) is glad to present the maiden edition of our CREDC-Newsletter. For the moment, the newsletter will be published electronically once in every quarter. Our goal is to create a forum for information exchange on our activities relating renewable energy technology here in Nigeria and other relevant information.

CREDC with support from her partners have initiated several projects with a nationwide scope to promote renewable energy and energy efficiency in Nigeria. CREDC has vast experience in the area of renewable energy, energy efficiency, campaign against deforestation, water and sanitation and climate change. CREDC is also the first NGO to implement solar mini-grids projects in Nigeria with a total of three sites so far.

In view of the wide audience we seek to reach out to through this medium, we encourage more contributions from the scientific community and renewable energy practitioners to ensure a continued success of the newsletter. We also welcome comments and suggestions that could improve the quality of the newsletter.

The editorial team will continue to bring to your door step up to date and information on our activities and other relevant information around the world. Enjoy reading!!

When the Grid Becomes the Back-Up Energy Source for Business Enterprise - The Nigerian Story by Godfrey Ogbemudia



Introduction

As blood is to human beings, so is energy to business enterprise. The different between the developed countries and under-developed countries of the world is energy access. For example, an IEA report in 2010 stated that the residential electricity consumption in Sub-Saharan Africa, excluding South Africa, is roughly equivalent to consumption in New York.

It was widely reported in several national dailies in the country on the 31st of March 2016, when the total generating plants for about three(3) hours produced zero(0) megawatts of electricity. The shocking thing about it was that, it did not affect economic activities in any way because Nigerians and business enterprises operating in the country have now made their generators the grid and the grid as their back-up energy supply.

In its 2015 edition of Doing Business report, the World Bank ranked Nigeria 187 out of 189 countries with regards to the ease of getting electricity.

In march 2016, the National President of the Manufacturers Association of Nigeria (MAN), Dr. Frank Udemba Jacobs, Speaking at the sideline during a courtesy visit to the Minister of Science and Technology, Dr. Ogbonnaya Onu, in his office in Abuja put the daily cost incurred by its members in generating electricity to power their industries at over N9 billion.

It is no more news that a lot of industries have been forced to close down their manufacturing activities here in Nigeria and have relocated to other countries due to the epileptic power supply in the country. Other business places that are still in the country are finding it very difficult to break even due to the increasing cost of production occasioned by lack or in most cases poor electricity supply. Business enterprises run almost entirely on generators powered by diesel or petrol.

Current Challenges with the Grid

Since 2001 when the National Electric Power Policy was adopted up till May 2015 with the unbundling of Transmission Company of Nigeria (TCN) into an Independent System Operator (public) and a Transmission Service Provider (private), the federal government has shown real commitment to privatization drive of electricity sector here in Nigeria. In spite of all these, technically the grid is still far from the capacity of been able to deliver at least 40,000MW of electricity daily to meet the demand of the population put at about 180 million as at April 2016, for Nigeria to achieve her vision 20:20:20 goal.

Currently, Nigeria can't even boast of 5,000MW daily generation. If you combine the 23 generating companies (GENCOs) together in terms of installed capacity for both the gas and hydro power plants, it's about 12,067MW but you never get this from them. According to the National Energy Regulatory Commission (NERC), the installed available capacity is about 6,840MW. But right now since 2015, the actual generating capacity is 3,941 MW which is usually occasioned by shortage of gas supply and reduction of water level at the dams.

According to (REEEP), Nigeria's per capita power capacity is 29 watts per person compared with Brazil's 480 watts per person and America's 2,900 watts per person. Nigerians connected to the national grid experience 80% demand/supply gap and most businesses self-generate their power. Additionally, the transmission network is

overloaded, with poor voltage profile in most parts of the network. There are frequent system collapses and exceedingly high transmission losses, often in the region of 30-35%.

Solving Business Enterprises Energy Challenges in Nigeria

With the uncertainty surrounding the petroleum industries as a result of global decision to move away from fossil fuel completely and the current challenges in the national grid, solar energy is the sustainable solution to the issue of stable power supply for business enterprises in Nigeria.

Nigeria possesses huge potential of solar energy sources. She lies within the sunshine belt and the solar radiation varies from about 3.5kWh/m²/day in the southern part to 7kWh/m²/day in the northern region of the country with an average daily sun hour of about 6-8 hours per day. Most business run actively within 8hours (8am-4pm) in Nigeria.

Captive generation using petrol and diesel is very expensive and will continue to add to cost of production. In 2009, in a document authored by the Assistant General Manager, Project Monitoring Office, Ify Ikeonu, The Nigerian Electricity Regulatory Commission (NERC) revealed that Nigerians spend about N796.4 billion (approximately \$5 billion) yearly on fuelling their generators. A breakdown shows that N540.9 billion was spent on diesel and N255.5 billion goes into the purchase of petrol annually for power generating sets.

Doing captive generation with solar PV is far cheaper. Although the initial upfront cost may be expensive depending on your energy demand (if batteries will be involved), it pays for its own self. For example, the headquarters of the organization I currently work with, the Community Research and Development Centre (CREDC) in Edo state southern, Nigeria runs completely on solar pv system which was installed September 2014.

In nine months, the system has paid for its self and we have never had a down time in terms of power supply till date.

Solar system components are becoming cheaper and globally, renewable energy is attracting huge investment yearly. The report titled "Global Trends in Renewable Energy Investment 2016" just released by UNEP and Bloomberg started that Global investment in renewable power capacity, at \$265.8 billion, was more than double dollar allocations to new coal and gas generation, which was an estimated \$130 billion in 2015.

Nigeria-REAP the Journey So Far

The Nigeria Renewable Energy for All Project (Nigeria-REAP) was officially launched by the Community Research and Development Centre (CREDC) on the 22nd of October, 2014. Our target is Nigerians in the urban areas. These include; (Individual homes, cooperate bodies, private business outfits that need regular and improved electricity supply as compared to what they currently have from the grid. Each beneficiary solar systems are sized according to their energy demand or financial strength with allowance for scale up in future as their energy demand increases.

All installations so far have been concentrated in two cities (Abuja and Benin). This is because CREDC offices are currently in these two locations nationwide.



Installation ongoing at a Client's House in Abuja, Nigeria

Solar energy solutions provided so far for private residence ranges from 800W to 1.4KWp solar pv capacity. Under this project, CREDC has also provided solutions to energy challenges encountered by fish farmers across the country with about three (3) solar powered bored installed ranging from 1-2horsepower solar water pumps. CREDC has installed about 25 solar suction nationwide.

The Solar Graduate Training Program

The Solar Energy Graduate Trainee Program (SEGTP) was inaugurated in November 2015 by the Community Research and Development Centre (CREDC) in partnership with Edo State chapter of the National Youth Service Corp under the Skill Acquisition and Entrepreneurship Development (SAED) scheme.



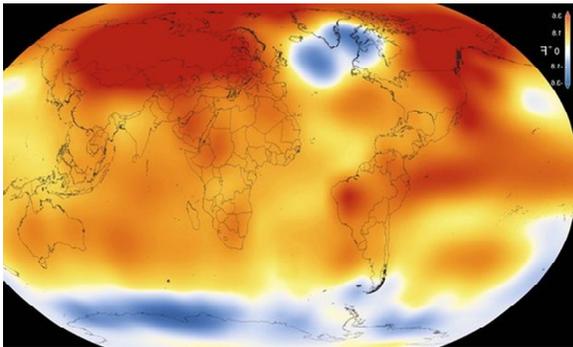
Cross-Section of Corp Members during the on-camp training.

The Solar Energy Graduate Trainee Program (SEGTP) is a platform on which CREDC fully implements the SAED scheme as it relate to Power and Energy thematic area of the scheme. The training is broken into two; On-Camp Training (OCT) where corps members are trained for two (2) weeks during their three weeks compulsory orientation camp program. They are introduce to solar PV technology installation and maintenance.

The second phase is; Post-Camp Training (PCT). After the orientation camp, corps members who

were trained under the power and energy thematic area will now enroll fully for a one year post camp program were they are exposed to practical field experience of solar pv applications including household solar systems, community solar projects, solar borehole, maintenance, etc.

March temperature smashes 100-year global record



An illustration shows that 2015 was the hottest year since 1880. Photograph: AFP/Getty Images

The global temperature in March has shattered a century-long record and by the greatest margin yet seen for any month. February was far above the long-term average globally, driven largely by climate change, and was described by scientists as a “shocker” and signalling “a kind of climate emergency”. But data released by the Japan Meteorological Agency (JMA) shows that March was even hotter.

Compared with the 20th-century average, March was 1.07C hotter across the globe, according to the JMA figures, while February was 1.04C higher. The JMA measurements go back to 1891 and show that every one of the past 11 months has been the hottest ever recorded for that month.

The UN climate summit in Paris in December confirmed 2C as the danger limit for global warming which should not be passed. But it also agreed to “pursue efforts” to limit warming to 1.5C, a target now looking highly optimistic.

The impact of the heat has been seen around the world and at the end of March scientists announced that the winter peak of the Arctic ice cap was the smallest ever recorded on records going back to 1979.

To read further click: <http://www.theguardian.com/environment/2016/apr/15/march-temperature-smashes-100-year-global-record>

Climate Change and You (Part 1) By Dr. Okhawere Martin

Tackling climate change is essential to humanity's future and prospects. Recently at the United Nations, 175 countries reaffirmed their commitment to ambitious climate action, coming together to sign the Paris Agreement that unites nearly every nation in a common endeavor against climate change.

This agreement was the culmination of years of effort that concluded last December, 2015 in Paris when states, spurred by their citizens, agreed to work to keep global temperature rise well below 2° Celsius to stave off the worst impacts of climate change on health, food security, and extreme weather.

The Paris Agreement sends a clear signal that the transformation of the global economy to low-emission, clean energy, climate-resilient growth is beneficial, already under way, and ultimately inevitable.

A recent study on renewable energy from Harvard University reaffirms that clean energy positively benefits both the climate and public health. As a

result, the deployment of clean energy and energy efficiency has a positive economic impact.

The EPA Clean Power Plan is a great first step towards deploying greater amounts of clean energy and energy efficiency solutions – these actions will generate positive health benefits and begin to address the climate change problem in a meaningful way.

As global temperature increases, rich countries' economies continue to prosper, but the economic growth of poor countries is seriously impaired.

As we begin to experience an unprecedented shift in temperature, we are starting to see the immense impact climate change will have on people around the world, especially those living in low-income countries. Low-income countries contribute just a tiny fraction of greenhouse gases (GHG), yet, they stand to lose the most if something is not done to curb emissions. Bearing the brunt of the damage caused by climate change, low-income nations are especially susceptible because their economies often rely solely on agriculture and most do not possess the resources to ease the risks posed by climate events.

The adverse health effects of climate change will be broad and will tax public health resources globally. Vector-borne diseases, foodborne and waterborne illnesses, malnutrition, respiratory and allergic disorders, heat-related disorders, collective violence, and mental health problems will all likely increase due to climate change. Already vulnerable populations including the poor, minority groups, women, children, and older people will face the greatest challenges brought on by climate-caused illness. Malaria, Rift Valley fever, Tick-borne encephalitis, West Nile virus and recently Zika virus disease are spreading due to climate change.

Along with minority populations and poor people, women are more vulnerable to the health consequences of climate change.

There are many ways in which climate change disproportionately affects women, including and especially adolescent girls. In low-income countries, women and adolescent girls generally assume primary responsibility for gathering water, food, and fuel for their households. Climate change-induced droughts make this work much more difficult.

The challenges presented by climate change disproportionately affect already vulnerable groups; investigators warn that caution must be exercised when trying to manage the effects of climate change. "International organizations and governments at the national, state/provincial, and local levels should ensure that human rights are considered in developing and implementing mitigation and adaptation measures. "

Energy plays a central role in the global economy, and for more than a century one of the cheapest and most prevalent sources of energy has been fossil fuels — coal, oil, natural gas, and the power generated from these fossil fuels. Unfortunately, fossil fuels have also been a major source of carbon emissions. In 2010, fossil fuels contributed nearly two-thirds of greenhouse gas emissions from human activity.

Some worry that a switch away from fossil fuels could have a significant cost to the global economy and undermine the financial system. CPI analysis demonstrates that a transition to a low-carbon energy system could free up trillions of dollars over the next 20 years to invest in better economic growth.

Renewable energy has significantly lower operational costs compared to the high ongoing expenses of coal and gas extraction and transportation. Though capital costs are higher for

renewables, the net result is still up to \$1.8 trillion in increased investment capacity, creating opportunities for growth and lower costs that could reverberate across the economy.

Upcoming Conferences/Workshop

1. **Nigeria Power Forum:** 13 June 2016 Strategic Conference |Nicon Luxury Hotel Abuja| Nigeria
Click here: <http://www.nigeria-power.com/>

2. **The Nigeria Alternative Energy Expo 2016:**
19-21 October, 2016 at the Shehu Musa Yar ' Adua Centre Abuja. Click here:
<http://www.nigeriaalternativeenergyexpo.org/index.php/about-naee-2015/>