

Electrification of Emuhun Village in Edo State Nigeria, Using Renewable Energy Mix; Underlying Principle With 16.5MWh Annually With Circutor Energy Dispenser for Load management

Introduction

Despite the fact that Nigerian has hefty deposit of oil and other natural resources, available statistical information has indicated that over **Seventy five (75) Million** citizens has no access to electricity, this phenomenon may trudge, clump, or lumber for the next 50 years if the government fails to consume our large base renewable energy resources clamouring for applicability. Gleefully the price of renewable energy specifically Solar is constantly being plummeting to level rivalling that of conventional power generation. Nigerian should hear the sound of privately oriented drumming that oil dependency is cataclysm or catastrophe to our future because oil may dry up one day but innovating technological advancement in research and technology is the only music of the future. Solar power harvesting is the source I posit as a viable mainstream option for future power generation could be roof top PV installation **Fig 1** for all and sundry rural dwellers because the consequences is becoming very competitive with conventional technique.



Fig 1 PV Roof Top 7.4KWp Installation

Emuhun Village is denizen in **Uhunmwonde Local Government Area (LGA)** of **Edo state** in **NIGERIA WEST AFRICA**, the head quarter of LGA is in the town of **EHOR**.

Uhunmwonde LGA has an area of **2,033 km²** and a population of about **120,813** as at year **2006** Nigerian last general Census. Worth noting is that Nigerian has about **774** local government areas. The total population statistically today stand for over **173 million** people in Nigeria, with straddling states number to **36** plus our federal capital operating un-officially as a state making our total official state with federal allocation as **37** numbers. My homeland is within **Edo State** whose capital is **Benin City** with a long lasting history of having forth vehemently with the British over 100 years ago. **EDO STATE** has a population of about **3,233,366** people and total land area is **19,794sq. Km** The state lies approximately between **latitudes 5°44'N** and **7°37''N** and between **longitudes 5°44** and **6°43''E**. Edo State (See **Fig 2**) is in a low-lying area except to the north where it is marked by undulating hills rising to a peak of about **672** meters above sea level. The current oldest man in the village who serve as the leader is **Pa. Enaruna Igiebor** becomes late few months after witness the commissioning in March 2016.



Fig 2 Nigerian Maps



Fig3 Project Over Views

The purpose of this Project was to make available in **Emuhun village Edo State** Nigeria meagre item for consumption called electricity adequately suitable for indispensable submission prerequisite for lighting and water produce proper. The resultant effect will/has adequately supported the upbringing of the next generational children of this village who has no dogma, philosophy of when this bring into being would be available to the village, which I has foretell would be over five decade from today because of non potential of economic return on investment for the utility provider. The implementations has sufficiently cover the nitty-gritty, crux of the matter, and rudimentary philosophy of renewable energy available in the cosmos today for harnessing electricity, but pivoted on the common researchable methodology by amateurish prior to application by installer. The apposite or pertinent consecutive processes require implementing this solution as replica for other villages across the Country in Nigerian and few Africa inhabitants is explicitly mystify. The project has addresses the values and culture of the Nigerianazation norms that could have affected the success of the implementation phases.



Emuhun LV Distribution poles



Meter installation Team



Fig 4 Project overviews

These villages has been existing for over 250 years without electricity, original creed or system of belief integrate studies of four communities settlement with population

straddle about **400 people** in four settlement areas (**35 Houses use for first project**, and has implemented optimistically the provision of electricity and water for two out of the four settlement due to lack of sufficient fund for execution for the entire community. A total power of **7.6KWp** Solar Photovoltaic Mono/Monocrystalline type used to implement the two projects, cumulatively generating about **17MWh** annually and optimistically with future expectation to complete the second stage of the project with additional **16MWh** annually before end of **2018 proper**. This is a practical oriented implementations rationale and hugely Philanthropically Service based, in Nigerian argot, patois **“a one man show”**. Complicatedly sourcing fund from Nigerian bank or government is like passing the head of an elephant through the eye of the needle.



Fig 5 Circutor Dispenser meter installation

The major problems faced by utility provider world wide are due to increasing demand on supply of power by user without any ideology of losses as well as power theft pilferage and wastage of expensive and limited energy owing to the use of overload or low efficiency equipment in utilization sector, these challenges on the implementation was resolved using **Spanish (Circutor) Energy Efficient Smart Meter** Programme for maximum load for each house in **four stages** of operation in this manner **6 – 9AM daily 100Watts** demand **9AM – 4PM daily 300Watts** demand **4PM – 12AM daily 100Watts** demand and **12AM – 6AM daily 50Watts**, because energy efficient is centre on a way of managing and restraining the growth in energy consumption. Further on energy proficient system this project would remain as one of the most energy well-

organized project in the entire globe, capitalizing on the benefits of **2 – 3 watts** maximum filament light emitting diode/LED in the entire project implementation.



Fig 6 Circutor Dispenser meter installation

The actual load demand for the lighting purported at **14.46KW** using the conventional modus operandi, but with the application of filament LED which we employ in order to make the design energy efficient for functioning reduced to **1.1KW** making a diminution of over **92%** contrast with the application of an unadventurous slant to realise the project. LED has longer life, decrease maintenance and lamp replacement cost, LEDs does not demand replacement often, LEDs also consume less energy; thus the overall cost of a LED system can be significantly high initially but lower than that of conventional lighting systems on the long run. Most conventional lamps operate on **220-240V 50Hz** voltage level we specifically exploit sophisticated know-how with the dogma of switch mode power supply. The input supply voltage for entire filaments LEDs range from **85 – 265V 50Hz**, this further make the lamps universal in applicability and also resolved problem with low voltages due to losses on distributions network this we had called **Wonderfulology** in practice!



Fig 7 Celebration of the project by villagers

No wonder the village has become sight for tourism or pilgrimage of **RENEWABLE** energy applicability, the Utility officer has once accused **Havilahrend** officer for exploiting them of the rebate on billing rationale, Various powerful organization has visited the village evaluate the modus-operandi of implementation, the truth unpin the style of building a residential house and integrate a generator room to enable the technological assembly of PV, Inverter, MPPT charge Controller, Batteries, RCCB board, see **Fig 8**. From this switch room the entire village was electrified.



Fig 8 PV Generator Room

I had received accolades from know government officers that know my manner of life and the vision to better the life of the poor and needing one in the rural dwellers, USAID

officer **Fig 9** privately has come to evaluate the ideology, state government officer has likewise appraise the village with the concept of implementation. Unfortunately there are major source of discouragement as well unless grownup adulthood knows what he wants in life he or she will end up in a precarious situation he never wish for his or her self. I was dogmatically determined to help the rural dweller from now and when God ask me to come home, consequently friends whom I see is inimical to this noble objective has been gradually discarded from my life in a meticulous manner. They had almost eroded my mentality with their bad latent seated ideology of eat alone and die alone.



Fig 9 USAID Team unofficial visit inspection

Exactly two months after commissioning, **May 25th 2016** the load consumption behaviors was conducted, the result was encouraging as the philosophy of consumption promoted to the villagers was been adhere to painstakingly, scrupulously, meticulously and fussily. The main concept was to eradicate the use of kerosene and candles in the night for lighting and added in other occasion little pleasure during the night in the like of TV, Radio and musical ancillaries. **Fig 10** shows analysis of load consumption overview. Original design philosophy was based on **31KWh** but the actual load demand was put at **24KWh** which spell good omen for longevity and durability.

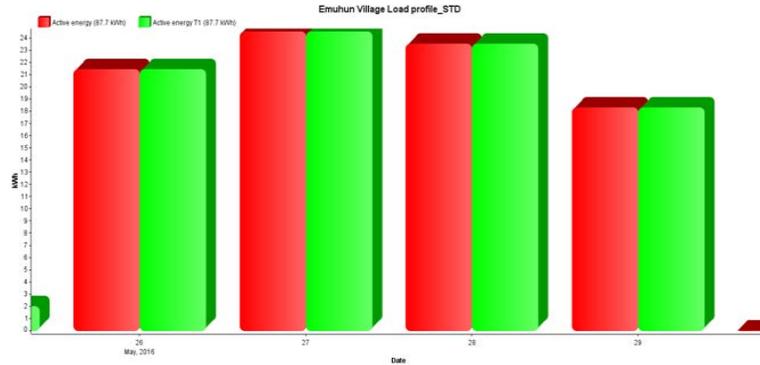


Fig 10 Compare design against actual demand

The project was based on philanthropic ideology but on the other hand the result shows that if such a project will be commercialized would be economically viable at the prevailing commercial lending rate by Nigerian Bank of Industry as it yields a negative net present value as the name implies for implementations. However, the project becomes viable when commercialized with huge revenue will be generated from sale of water at a reduced rate of #6 per 25 liters keg and sale of electricity to the communities at #36 about \$0.12 per kWh.



Fig 11 Village name added with The Wonder Land

The sign post **Fig 11** at the entrance to the village from the major road was dramatically changed with the additional inscription 'Emuhun Community *“THE WONDER LAND”*'. No wonder the visitors we have received since installation is over one thousand.

Summarizing the achievement and the happiness I have brought to my home land I would posit ***I HAVE NO REGRET ANYMORE*** I am very much contented with the mission and dreams as per the end result of the project. One of the greatest prayer received from one of the elderly woman interpret thus ***“From Today You Are not killable”*** in another occasion she opine ***“The only person who can determine the total sand available in the entire globe has the power to kill you”*** Her position and view was that in this part of the world most people never appreciate good gesture and philanthropic work of the nature who ever therefore plans to harm me with any diabolical means will never succeed. Above all the project was wearisome but the result justify the means consequently I am happy doing what I know how to do best, **HELPING THE NEEDED AND THE POOR!**

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