**NDAWO VICTORINE (UD62171BFI71228)**

**QUANTITATIVE FINANCE**

**XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX**

Course Name

UN Sustainable Development Goal 7: Affordable & Clean Energy.

**ATLANTIC INTERNATIONAL UNIVERSITY**

**HONOLULU, HAWAII**

**DATE: 26th MARCH, 2022**

**TABLE OF CONTENTS**

 **PAGES**

Table of Contents………………………………………………………………………… 2

List of Abbreviations…………………………………………………………………….. 3

Introduction……………………………………………………………………………….. 4

The Problem with Solar Energy in Africa …………………………………………….. 5

Universal Goal on Energy ……………………………………………………………… 6

Benefit of SDG7 Achievement…………………………………………………………. 6

Necessity for Action: The Global Road Map ……………………………………….... 7

Bibliography ……………………………………………………………………………… 8

**LIST OF ABBREVIATIONS**

CO2: carbon dioxide

K: -kilo meaning x103

Km: kilo meter

KW: kilo watt

KWh: kilo watt hour

KWP: kilo watt power

M: -mega meaning x106

MW: mega watt

G: -giga meaning $x10^{9}$

GW: gigawatt

SD: sustainable development

SDG: sustainable development goal

SDG7: sustainable development goal number 7

UN: united nation

UNSDG: united nation sustainable development goal

**Introduction**

Globally, there is a twin energy problem. They are lack of access to energy and most of the energy being produced lead to the emission of greenhouse gases that consequently causes climate changes. This means that to completely stop climate changes, the concentration of greenhouse gases in the atmosphere has to be stabilized,(Max, 2020)**.** This is only possible if the world’s emission of greenhouse gases drop to a net-zero. To bring down this greenhouse gases is one of the world’s biggest challenge. Even so, the world has a large energy problem. The world is actually encountering a twin energy problem. This is called the twin global problem of energy. The first problem is that those having a low amount of carbon emission cannot access energy, (Max, 2020). Averagely people living in the United States emit significant amount of CO2 in the atmosphere than those living in poor developing countries like Ethiopia, Uganda or Malawi could emit in one year. The two main factors that causes the poor to emit low greenhouse gases are:

* Lack of access to technology and modern energy. This is called energy poverty. According to research, 760 million people are still living today without modern energy sources for basic activities like cooking and heating, (Stadler, 2015). They still rely mostly on solid fuel sources like firewood for cooking. The continuous cutting of trees has created another problem called deforestation. The usage of non-modern energy sources like firewood, dungs and waste from crops has resulted to massive health challenge to those living with energy poverty. This has led to indoor air pollution. According to Ivanova (2020), 1.6 million people die within a year due to indoor air pollution. This is two times the death number that results from poor sanitation. All over East, Central and West Africa, wood is the main source of fuel and is providing more than half of their total energy. Consequently, the lack of accessibility to modern energy sources subject the citizens to poor living conditions, no electricity and when there is no electricity, it implies that food will not be refrigerated, there will be no usage of washing machines, no electricity in other parts of the country.
* The second energy problem is that the people having access to modern energy continuously emit a high concentration of greenhouse gases. This second energy problem is well known than the first problem. As such those that need to mostly reduce the emission of greenhouse gases are people who are extremely rich, (Ivanova, 2020). That is to say that those who are extremely rich produce a high concentration of greenhouse gases than those that are averagely rich. This leds to the Paris agreement goal. This goal is to keep the increase of global average temperature below 20C above the re-industrial level. This goal can only be achieved if the emission of the greenhouse gases drop to a net-zero. According to (Eivind, 2021), countries like Germany, Ireland and Greece still have more than 99% of their households having an emission of more than 2.4 tones in a year. Poorest African countries like Malawi, Burundi have emission that is closed to zero. Hence the emission of CO2 is highest where living conditions are better. In such regions, child mortality is very low, there is good access to quality education and very few people suffer from hunger. On the other hand, in some countries where they rely on fossil fuels as predominant energy sources, their access to modern energy will lead to the emission of high concentration of carbon. Hence the second energy problem affect majority of the world’s total population. There are many limitations when addressing the twin problems. One of this limitation is titled: the problem with solar energy in Africa. In the paragraphs below we have highlighted this problem and stated some of the roadmaps.

**The Problem with Solar Energy in Africa**

Due to the twin energy problem, findings are going on in the world so as to resolve it. It is found that The Sahara desert and North Africa is one of the world’s source of untapped solar energy, (Ivanova, 2020).

Findings from the United Nation body shows that the solar energy that strikes the surfaces of these areas (Sahara desert and North Africa) possess the potential to power the whole world. A solar panel placed in Algeria can generate three times more electricity (5.6kWh/kWP) than the same placed in Germany (2.3kWh/kWP). (from the youtube video). What was once a geographical disadvantage: the scorching sun of the vast expanse of land could now be capable of providing an economic boom for these historically impoverished nations. One panel located in the farm of one square meter on an average is capable of generating 5 to 7kw of energy each day and $1km^{2}$ could generate between 5 to 7 giga-watt of energy each day (5 to $7x10^{9}$Wh energy each day). The solar panel of $1000km^{2 }$ placed in thesame farm could generate 5 to 7 terawatt of energy each day ($5 to 7x10^{12}Wh of energy each day).$ This is enough to satisfy 100% of Europe’s energy needs. And if the surface area of the solar panel increases by ten, then it will be generating a power of $6x10^{13}Wh$ of energy a day which is enough to power the entire world. This statistics is very impressive. In the same manner, a solar power plant in Ethiopia is set to transform a simple mathematics into a reality. One challenging issue is to transform this figures into a reality. Many attempts has failed because of any one of the reasons below:

1. Transporting electricity out of this remote regions is the first challenge. Currently there are only 2 interconnections connecting North Africa into Europe; both are located between Morocco and Spain.
2. 700 megawatts interconnections. One was completed in 1998 and the next one was in 2006.
3. The third interconnection is expected to be completed sometimes before the year 2030 for a total of 2100MW. If we want to transport enough electricity to power Europe, ignoring transport loses and storage issues, (592 – 831) more of the 700MW inter connections will be needed.

This twin problem of energy led to rise of the universal goal of energy.

**Universal Goal on Energy**

The universal goal on energy for all by 2030 was instituted considering energy as central. It was instituted as a result of the first summit on energy involving 130 member countries under the auspices of the UN Secretary General in the person of Antonio Guterres. This summit was the first ever in 40 years. Thus, the summit led to a transformation action to handle the twin energy challenge. This involves the SDG7, which calls for “ensuring access for affordable, reliable, sustainable and modern energy for all” to be reached by 2030, (Max, 2020). This is stated in the General assembly resolution 74/ 225. Due to the energy need for humanity; a high-level dialogue was held on the 24th September 2021. This dialogue consisted of;

* Over 130 head of states and government;
* High representatives and;
* Multi-stakeholders.

The purpose of the dialogue on energy was the promotion of the implementation of energy goals and targets which represent the 7th item on the UNSDG. Thus, in the achievement goal the 2030 agenda for SDG and the Paris agreement to climate change, energy is central. The goal to ensure universal access to clean affordable modern services for all by 2030. The precision was that;

* Energy should be reliable.
* To a larger and more meaningful extent on the globe energy mix increase the sharing of renewable energy across the globe.
* Improving the energy efficiency thus doubling the global rate.

 **Benefit of SDG7 Achievement.**

When the SDG7 goal will be achieved, it will lead to benefit in the following areas:

* Speed up the action rate to fight climate change.
* It will facilitate the accomplishment of other SDG’s. like eradication of poverty, climate change, equality on gender basis, food security, health, quality education for all, sustainable cities and communities, establishment of clean water and good sanitation, good and decent jobs, great innovation, good transportation facilities, displacement issues and refugees.
* Globally, adequate investment in renewable energy and efficiency should be tripled by the year 2030.
* Also by 2030, there should be a shift from the usage of fossil fuels to renewable energy sources.
* Since the other SDG’s goals will be accomplished, international cooperation should scale up in response so as to speed up private and public finances coupled with investment that is needful for the acceleration of the transmission of energies. This transmission is especially for developing countries like Cameroon, Ethiopia and even for small island developing states**,** (Max, 2020). Thus prioritizing access to finance and technological provision.
* Recently statistics showed that 760million people are still living without electricity. Also 2.6 billion people are still cooking with harmful fuels. Thus decisive actions are required to obtain access to clean energy for this class of people. So, there is an urgent political right-of-way to ensure the access to clean energy that is decarbonized by 2030.

**Necessity for Action: The Global Road Map**

Generally, once a problem is identified there is a need for action. Without action, the SDG7 will not be resolved. So, below are some of the global road maps to help accelerate the SGD7 action so as to promote the achievement of the 2030 plan. They include Closing gaps to promote access of energy; this will help reach out to 760million people who are living without electricity. Also to ensure a good cooking fuel to 2.6 billion people. Also, Fast transition to energy systems that are decarbonized. One of the fascinating road map is the recent development of the Desert Technology that has replaced the Desert Tactical Arms. It consist of solar modules, inverters, controllers and batteries. The solar panels are then placed on a read-made structure. The system operates on a 24/7 time base with almost no noise. Within the day, functional energy is tapped directly by the solar system with the aid of the inverter and control panel. There is a battery bank of a very high efficiency in the Sahara. Through this Power bank, the Sahara then provides electricity.

**Bibliography**

1) Eivind, L. B. (2021). Future Changes in Consumption: The Income Effect on Greenhouse Gas Emission. *Energy Economics*, vol 15.

2) Ivanova, D. &. (2020). To 1 % of EU Households have Carbon Footrints 22 Times Larger than Climate Target Allows. *BRAVE NEWS EUROPE, BNE*.

3) Max, R. (2020). The World's Energy Problem. *Our World in Data*.

4) Stadler, K. e. (2015). Environmental Impact Assessment of Household Consumption. *Journal of Industrial Ecology*.

5) [https://youtu.be/1RDJAjlzyCUt 476](https://youtu.be/1RDJAjlzyCUt%20476)

6) [https://doi.org/10.1111/jiec. 1237](https://doi.org/10.1111/jiec.%201237)

7) <https://unstats.un.org/sdgs/report/2021>

8) www.brilliant.org/realengineering

9) [www.desertech.com](http://www.desertech.com)

10) [www.dlr.de](http://www.dlr.de)

11 [www.ourworldindata.org](http://www.ourworldindata.org)

12) [www.sdg.un.org](http://www.sdg.un.org)