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The Politics of Climate Change and the Rising Demand for Global Energy in the 21st Century:
Implications for Human and Economic Development

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ABSTRACT

Established that most governments prefer to boost global energy supply because it improves economies and translates to gainful employment for citizens, the rising global demand for energy from various sectors continues to trigger unprecedented consequences on the environment, resulting in hazardous implications. Hence, scientists argue that the rising demand for global energy by industrialized nations increases the vulnerability of persons and polities where these energy and mineral resources abound. Consequently, governments, multinationals, etc. are at a crossroads regarding how best to address this dilemma. Creswell's mix-method research deign and Merlyn's ex-post facto research methods for analyzing qualitative and quantitative data previously obtained from similar studies were used for attaining the objectives of the research. The study identified troubling and high-level politicking at play in most affected countries. Recommendations geared towards addressing the dilemmas emanating from the rising global demand for energy by governments and scholars were proffered.

KEYWORDS

Climate Change, Development Crossroads, Global Energy, Global Environmental Challenges, High-Level Politicking, Industrialized Nations, Political Development, Political Dilemmas

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GENERAL INTRODUCTION

Background to the Study

Some of the most recently held world global summits, forums, conventions and conference sessions on climate change and global energy issues (Hultman, 2018; IEA, 2019; Stevens, 2019; BBC, 2020 and World Economic Forum, 2020), revealed that there is a divide amongst most scholars and government officials who subscribe to the need for boosting global energy supply at all cost, (BBC, 2020; IEA, 2019 and Stevens; 2019) largely because it paves the way for improved economies, which in turn, translates to gainful employment and better living conditions for millions of persons in the world. On the other hand, there are a large number of scholars and government officials (The Open University [TOU], 2018; Stevens, 2019; IEA, 2019b; Clemente, 2020 and World Economic Forum, 2020b) who believe that the rising global demand for energy from various sectors of life and the economy, has triggered off an unprecedented economic and human development consequence and implications on the global environment, which presently accounts for numerous hazardous implications on the environment, the economy and on the lives and property of millions of people all over the world.

In the light of the above, scholars and scientists like (Funk and Kennedy, 2016; The Hamilton Project, 2019 and Nunn, O'Donnell, Shambaugh, Goulder, & Kolstad, 2019) argued that the rising demand for global energy by industrialized nations of the world have further increased the vulnerability of individuals in countries where these energy and mineral resources abounds in large quantity. Consequently, recent studies on climate change and global energy demand (Hultman, 2018; Kamarch, 2019 and The Hamilton Project, 2019) revealed that high-level politicking amongst government officials, multinationals, scholars and various interest groups are now at cross-roads regarding how to address the dilemmas resulting from the rising demand for global energy and its direct effect on man and the environment.

A recent study conducted by Pew Research Center (Funk and Kennedy, 2016) for instance, revealed that polarized views now abound concerning what views and opinions about climate research which scientists, politicians, and government officials are disposed to having or proclaiming in the 21st century. There is also a great controversy about what really causes climate change and what the cures are. On the other hand, there is the bipartisan and high-level politicking that tends to support the expansion and increased production of other forms and sources of energy, be it, crude oil, coal, fossil fuel, solar and wind energy, etc., irrespective of the adverse consequence it's been feared to have on man, the climate and his environment (Funk and Kennedy, 2016 and Rachman, 2019). A case in point is seen in 2017 when Scott Morrison, while in a session in the Australian Parliament, compelled his fellow legislators to embrace fossil fuel as the next way forward for development, as he brandished a lump of coal during a parliament session. While the left-winged members of the parliament scoffed him for his proposal, Mr. Morrison and his party had the last laugh later that season in the results of the elections which was declared during the following general elections. The decision of his party to hinge their politics on climate campaign resulted in his miraculous victory in the elections that followed afterward in year 2018, which saw him emerging as Australia's Prime Minister. This goes a long way to show how elections hinged on climate change in North America, Europe and other parts of the world, had the capacity to swing votes in the favor of those who are able to convince their electorates about the need and relevance for boosting and increasing the demand for energy.

Research Problem

In the light of the issues raised in the background for this study, it is clear that the subject and phenomenon of global climate change and the geometric rise in the demand for global energy is highly influenced by the high-level politicking now at play in major industrialized and developed economies of the world. However, the under listed specific problems constitute some of the main reasons that motivated the writing and the conduct of this research:

1. More alarming reports from reputable research centers and organizations (IEA, 2019; The Hamilton Project, 2019 and World Economic Forum, 2020) tend to indicate that the world as it presently is, is nearly gone beyond redemption from the total catastrophe that is set to hit the world soon as a result of rapid and unprecedented climate change taking place in the world today.
2. 21st century government officials and their electorates seem to be largely polarized on matters concerning the need to preserve the environment from further degradation, over those insisting on the need to diversify and identify more areas and sources for extracting more energy at all cost (Kamarch. 2019; Rachman, 2019 and Nunn, O'Donnell, Shambaugh, Goulder & Kolstad. 2019), irrespective of the consequences these political decisions and activities may be having on man, his environment and the global climate.
3. Various efforts and measures by government agencies etc., directed at addressing the rising cases of environmental hazards arising from rapid global climate change (Cohen, 2019; Hultman, 2018; Rachman, 2019; Vidal, 2019 and Victor, 2019), seems to be grossly unproductive or inefficient.

Research Questions

The issues raised and discussed in the background for this study highlight one pertinent and fundamental question which is: How are the decisions and actions of 21st-century governments' and political actors influencing the current hazardous trend of global climate change? This question notwithstanding, the under listed research questions guided the thoughts of the authors towards the actualization of the objectives proposed for this research:

1. What factors are really responsible for promoting the economic, environmental, and life-threatening climate changes that are presently being reported by virtually all global climate researchers and research institutions of the 21st century?
2. What factors are responsible for the increasing polarized views experienced to exist amongst 21st-century politicians and electorates, whose divided opinions and policy positions about global energy and climate change, have been identified to have enormous impacts on citizens, the environment, and on the global climate?
3. What are the most viable ways forward for addressing global climate issues? This question was central in the minds of world leaders who gathered in Davos Switzerland for the 2020 edition of the 'World Economic Forum'.

Research Objectives

While the general objective for the research is directed at identifying and analyzing the part and impact which 21st-century politicking amongst developed and emerging economies play in the rising demand for global energy and its consequence and implications for human and economic development, the following specific research objectives guided the authors in the path of attaining the objectives earmarked for the research:

1. To evaluate the factors responsible for the increasing life-threatening climate changes reported by major global climate researchers and research institutions of the 21st century, with a view to determining the most pertinent factors militating against addressing global climate crisis.
2. Interrogate and evaluate the factors responsible for the increasing polarized views experienced to exist amongst 21st-century politicians and electorates whose opinions and policy positions about global energy and climate change are identified to have enormous impact on citizens, the environment and on the global climate.
3. To ascertain the viable ways forward for addressing the global climate change issues currently crippling 21st-century polities.

Theoretical Framework and Methodology for the Research

The theory of change approach (ToC) (Bours, McGinn, & Pringle, 2014) was considered more appropriate a theory for this research since it was discovered to have the capacity of providing viable theoretical frameworks for the kind of analysis and investigations envisaged to take place later in the paper. The specific research questions and objectives proposed for this research necessitates that the authors adopt Creswell's mix-method research design (Creswell, 2003) and Merlyn's *Ex-post facto* research methods (Marilyn, 2013 and Wogu, Elegbeleye, Uwaoma, Chukwuedo, Edogiawere, Aguziendu, & Misra, 2020) for analyzing qualitative and quantitative data previously obtained from similar studies (Funk, and Kennedy, 2016; Hsiang *et al.* 2017; Carleton, *et al*, 2018; Hultman, 2018 and Clemente, 2020) on the subject matter of this research, for the purpose of determining how to effectively address the problems of global climate crisis believed to be orchestrated largely by the bipartisan nature of most emerging and developed polities of the world.

Creswell's mix-method was most favored for this study because the method allows for a combined or single use of both qualitative and or quantitative research designs for conducting research were it is clear that the quantitative research methods alone might not suitably be effective for gathering all the data required during the process of study, as a result of limitations associated with the single use of either of the methods (qualitative & quantitative methods). Marilyn's, *Ex-post facto* research design and method was adopted because the method largely accepts and adopts the use of previously analised data in the subject area of this study for determining the objectives earmarked for the study.

The Relevance of the Research

The recent burn fires which raged for months in Australia, destroying lives and property that ran into several billions of dollars towards the end of 2019, is proof of the kind of devastation which environments of developed economies of the world where high rates of Green House Gas (GHG) emissions released into the climate and earth' atmosphere, could suffer immensely from, as a result of the consequences of years of increased energy demand which in turn, boosted the activities of multinational mining industries and companies who in turn, must engage the earth and its environment to produce commensurate degrees of energy to meet this rising demand. The activities of these mining industries leave a large amount of CO2 in the earths' atmosphere that are known to be detrimental to the environment.

The need therefore for scholars, researchers, and scientists to devote quality time and resources for advancing research focused on identifying some of the unknown causes and factors that are currently suspected to be responsible for the new turn of events on the earth' climate and its environment, (IEA, 2019; Stevens, 2019 BBC, 2020 and Clemente, 2020), motivated and necessitates the timely embarking on this project. It is envisaged that the findings of this research will provide directions and guidelines for policy makers who must identifying some of the cures for global climate crisis and the part which 21st century politicking plays in influencing the rising spade of global climate crises. Where this is established, it becomes more feasible for all the appropriate officers to formulate and pass into law, appropriate policies that would help curb the rising crisis on global climate change.

CURRENT TRENDS IN THE LITERATURE OF GLOBAL CLIMATE CHANGE

The Rising Demand for Global Energy in Industrialized Nations

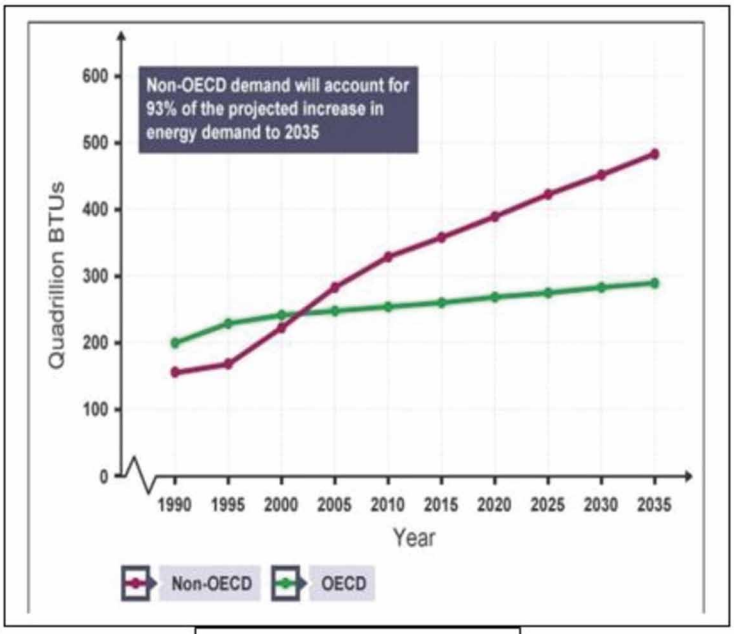
On the rising demand for energy globally, most of the literature considered for this study (Hultman, 2018; TOU, 2018; Stevens, 2019; IEA, 2019 and BBC, 2020), indicates that there is a disturbing rise in the number of corporate bodies, international organizations, industries, and nations that are demanding for a huge amount of energy for their sustenance. These reports indicate that while the demand for energy (Electricity Energy) is pretty high amongst developed countries, nearly the same proportion of energy demand (Electricity Energy) is sort after by individuals and industries from

developing countries, as indicated in (Figures 1, 2, and 3). For instance, the need for energy is projected to expand by 55% with increasing demand from 11.4 billion tons of oil to about 17.7 billion tons, between 2005 and 2030, which is the amount of oil needed to generate the commensurate number of electricity energy required via turbine engines (BBC, 2020), as indicated in (Figure 1). The bulk of the demand here is projected to come from developing countries, which in (Figure 1 and Figure 3), are described as energy utilized by 'Organization for Economic Co-operation and Development (OECD) and non-OECD countries. The main sources of energy in focus here include Gas, Coal, Oil, Fossil, Electricity and Renewable Energy Sources. These main sources of energy would account for some of the main primary sources of energy consumption in the world (Stevens, 2019).

In response to "Why" there is an astronomic rise in global energy consumption, studies revealed that the world population is still increasing. For instance, the population of the world in 2016, which was placed at 7.4 billion, was projected to rise by 1 billion in the next 10 years. Hence, the projected population of the world by 2050 would rise to about 9.6 billion people, that is, going by the data analyzed by a UN report of 2013 (Stevens, 2019 and BBC, 2020). In the light of the findings made by these research agencies, the following specific assumptions or initial submissions were made:

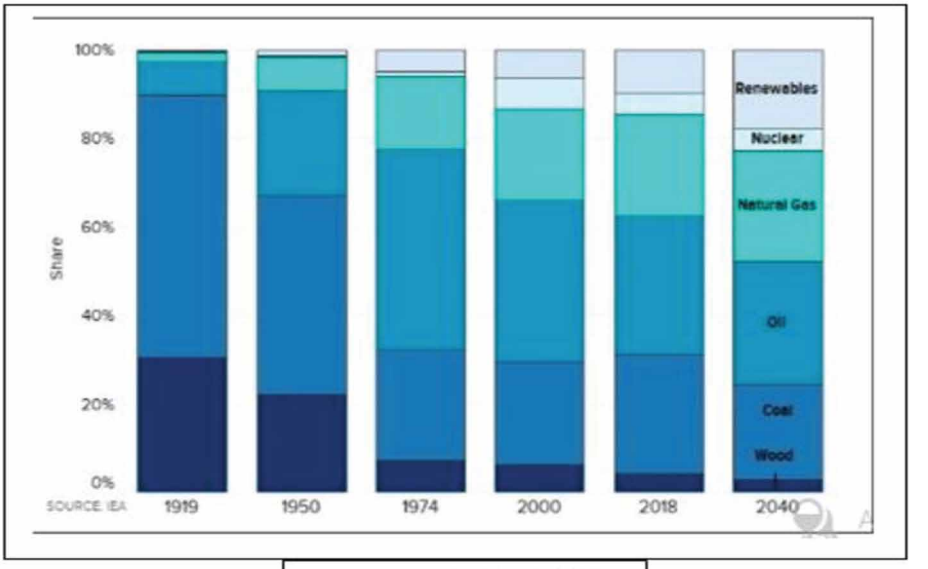
1. That going by the speedy growth of economies and an attendant rise in population growth, the resolve to relying on renewable energy resources as the main stay for energy production will not be sustainable, considering the growing demand for energy. (IEA, 2019 and Stevens, 2019).
2. In view of the recent trends of events, the output of oil is expected to continue to increase over the next decade. However, demand for more oil will soon begin to diminish around 2015, since as a result of technological innovations, there has been great improvements in the area of fuel efficiency and the large scale introduction of electricity powered vehicle. It is thus projected that reliance on fuel would totally flatten out by the 2030s (IEA, 2019 and Stevens, 2019). Please see (Figures 8) for details of this study.

Figure 1. Global shift in energy demand



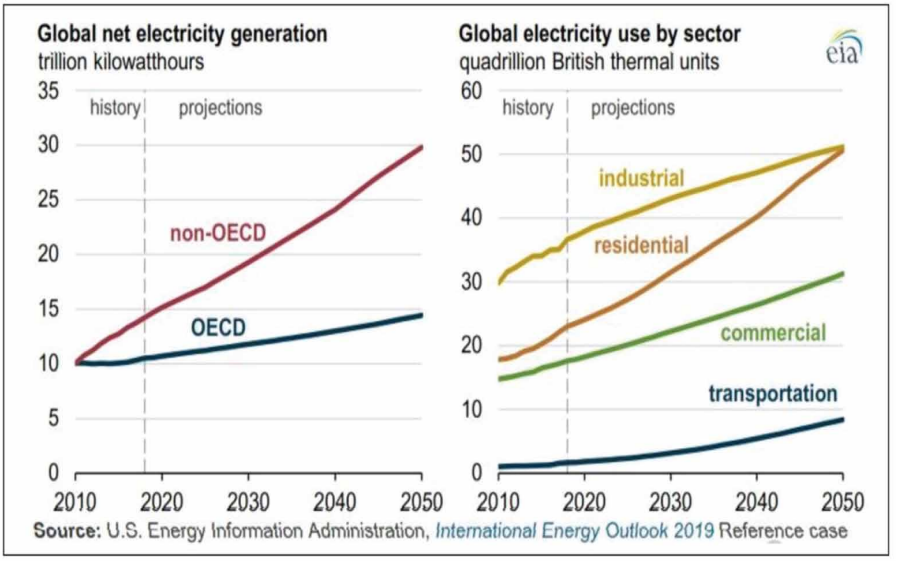
Source: (BBC, 2020)

Figure 2. Global energy demand



Source: (IEA, 2019)

Figure 3. Global net electricity generation and use by country and by sector



Source: Data obtained with permission from the US Energy Information Administration (IEA, 2019)

3. The (IEA, 2019) report on the 'World Energy Outlook' however observed that, in the light of the transforming global energy systems, they are not able to identify one simple solution to the problem at hand, except political leaders and policy makers take the responsibility of proffering clear directions that will provide a scope and viable direction for the future of global energy (IEA, 2019 and Stevens, 2019).

4. While the world may be heading towards relying totally on renewable energy sources, its total implementation might not be feasible at the moment since rising population rate continues to place a huge demand on energy, the kind that can't immediately be sustained if the world were to immediately switch over to renewable energy sources (IEA, 2019 and Stevens, 2019).
5. While the world is working towards transiting towards becoming a world that is carbon-neutral, the geometric rise in the number of people needing and depending more heavily on fossil fuel, etc, continues to rise sharply. This scenario is feared will continue until all concerned political and government functionaries take appropriate policy initiatives that will foster the actualizations of a carbon free world.
6. Despite the advances that has been made towards identifying and harnessing energy from alternative energy sources like the solar power and wind energy, the record of carbon emission recorded in 2018 hit an all new record height, the likes that have not been recorded before.

Deep Disparities and Variations in Energy Use

The amount of energy consumed per head is one of the reliable indicators of the degree of economic development of a country. One of the fundamental signatures which well-developed manufacturing and service sectors like the transport and entertainment sectors, are functions of a proportional and commensurate energy supply to these sectors. The consumption of energy per head in the US and in Canada for instance, doubles that of individuals and industries found in Europe and about 800 times more than those of individuals and industries from emerging economies (The Open University, 2018; BBC, 2020 and Clemente, 2020). The data in (Figures 1, 2, 3, 4 and Figures 5) provides information which further explains the trends and reasons for the disparity in the quantity of energy utilized per-head, per-country in non OECD and OECD countries (TOU, 2018 and Stevens, 2019). As it presently stands, energy consumption in countries like the US and China is reaching record heights, as inferred in (Figures 4 and 5). Thus, countries with the highest localization of industries, with individual who own vehicles and those who use energy regularly for their domestic local businesses at work and in

Figure 4. The rise of urban world population

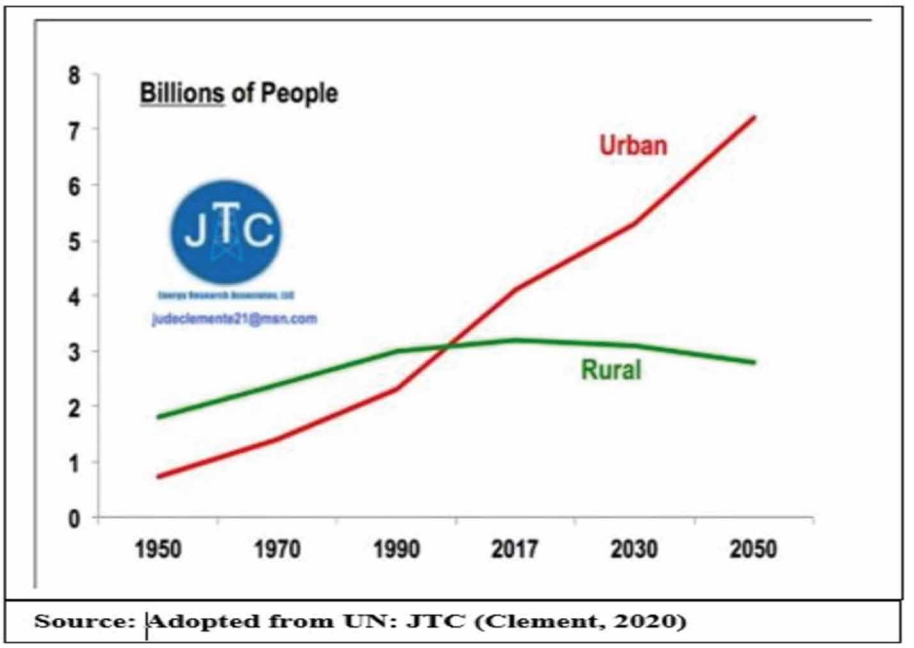
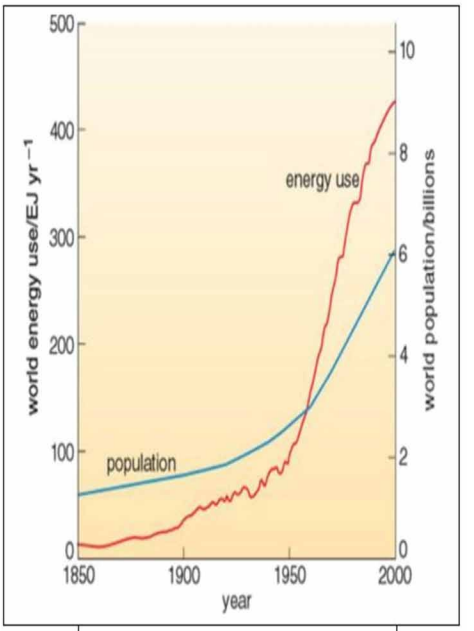


Figure 5. Population growth and primary energy intake



Source: Adopted from (TOU, 2018)
http://www.open.ac.uk/courses/find/science

their private homes, accounts for the high degree of energy usage in the urban cities as indicated in (Figures 4 and 5).

Naturally, developing countries in Africa and majority of the rural areas where these energy features (like basic electricity) are scares, with a low energy usage recorded, studies conducted on the urban centers revealed (TOU, 2018; IEA, 2019; Stevens, 2019; BBC, 2020 and Clement, 2020) that the number of people who lacked this basic energy swell by 80 million people every year. However, the problem is that, population growth of this days are beginning to take place in urban areas located mostly in developing nations, otherwise known as non-OECD countries where there is already a predominance of poverty and insufficient access to energy as indicated in (Figures 1, 3 4 and Figures 5). In contrast, rich and developed nations have urbanization rates of about 85%, as against the less than 40% of other really densely populated areas of the world like Bangladesh and India (Clement, 2020). Today, the world, which is just about 55% urban, at this growing rate, has been predicted to rise to about 75% urban as the world approaches 2050. With this rise in population comes a much greater rise in the demand for a commensurate energy supply and money to acquire these energy sources for daily life's use.

The disparity in energy use is further enhanced by the poverty that hovers over the African continent and most developing countries. About 600 million Sub-Saharan Africans have no access to electricity. While about 80% of the people living in the world reside in developing countries, that is, about 6 of every 7 humans in the world. About 16,000 kids below the ages of 5 years, die as a result of preventable diseases, most times orchestrated by the lack of required basic energy (Clement, 2020). Why should such alarming deaths take place in this century for a challenge (electricity) that was believed to have been addressed over a century ago? Indeed, electricity has since become a *sine qua non* of todays' modern day society. The data in (Figures 3) elucidates this fact. But this is not the case for a majority of the inhabitants of the world. The paper by Jude Clement highlights this point when he opined that:

Less than 2,500 kwh per capita, per year, over half the world uses less than 40% what the average European consumes and less than 20% of what we Americans use… Hence, Some 16,000 children under age 5 die every day from preventable causes, which is enabled by poverty, which itself, is enabled by a lack of energy… Consequently, a city with a population of Miami is wiped out every month by problems we believed to have solved over a century ago… Over 600 million Sub-Saharan Africans have no electricity whatsoever: "Electrify Africa and save hundreds of millions of lives" (Clement, 2020).

THE POLITICS OF GLOBAL CLIMATE CHANGE

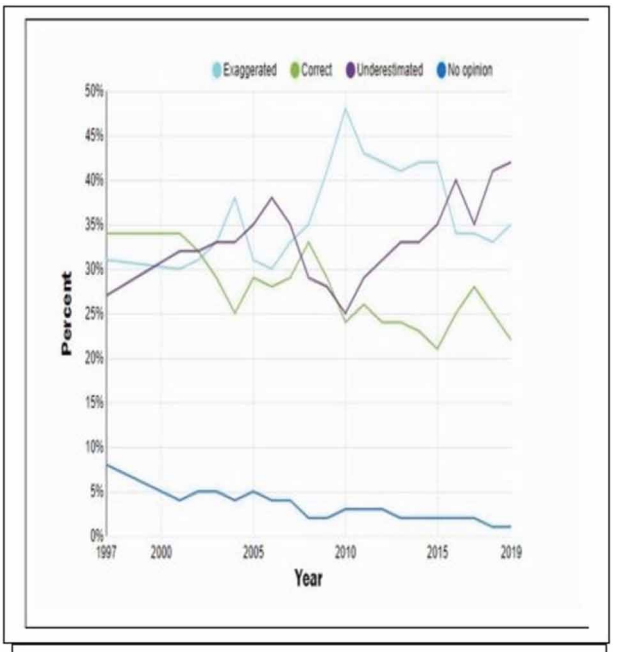
Recent studies on global climate change (Funk and Kennedy, 2016; Hultman, 2018; The Hamilton Project, 2019; Kamarch, 2019 and Rachman; 2019) and the political features which have now become a major influence on the whole debate on what degree of influence politics have on climate change, is suddenly becoming a matter of great concern amongst scholars and scientist who study the phenomenon of climate change. In the light of this, polarized opinions about climate change issues which are largely poised to tackling the major causes and cures for global climate crises have become one of the most discussed subject of all world conferences. This subject have now more than ever, become the focal point from where political parties and campaigners must draw arguments from, in their efforts to attract votes (Funk and Kennedy, 2016). The truth however is that political issues on climate change, goes way beyond the fact that climate change is taking a toll on the earth's physical environment (Kamarch, 2019) nor, that it has anything to do with what roles humans are playing to influence the present state of affairs. The study by Pew Research Center (Funk and Kennedy, 2016) observed that the subject of politics and climate change now goes beyond having polarized views about the climate. It has becoming highly bipartisan in nature with a section of the populace wondering whether to go with the alarming scientific reports about the effect of CO2 emission on global climate or whether to go with the majority of politicians or electorates who chose to settle with the idea of either expanding on the production of fossil, solar, or wind energy.

Public Opinion on Climate Change and Political Influence

From the studies conducted on the growing literature on climate change, it has become clear that the subject of climate change have become one of the toughest and most intractable political issues which most developed economies are beginning to experience (Kamarch, 2019). With growing scientific evidence from scientist and scholars about the real causes and cures of climate change. There is therefore, a growing consensus in the scientific community about the best ways of addressing global climate crisis issues. However, the public remains largely divided on the subject of global warming as indicted in (Figure 6), while a reasonable number of the political class have been discovered to be indifferent about the subject of climate change and global warming generally as indicated in (Figure 7).

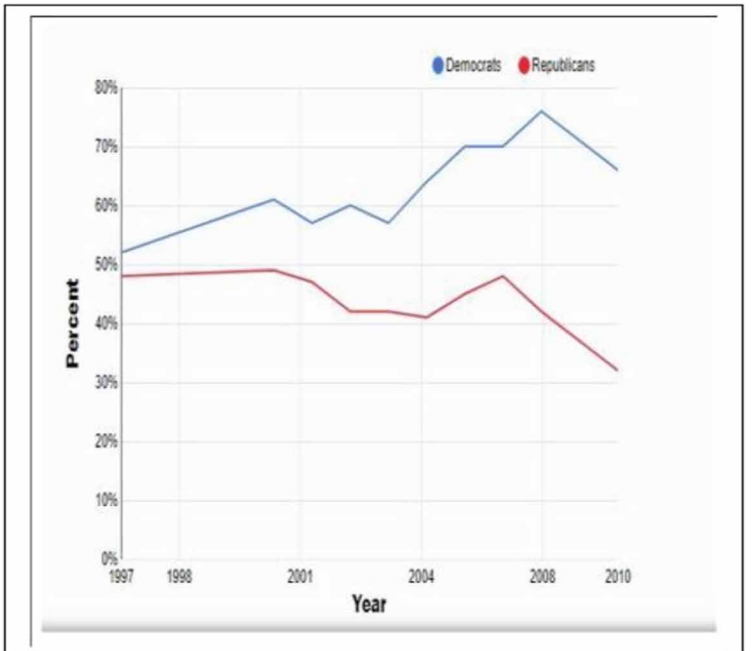
Results arising from the National Oceanic and Atmospheric Administration and Gallup public opinion (Quinnipiac Poll, 2018 and Kamarch. 2019) for the past two decades, adds credence to the point made here about the divided opinions existing between electorates generally and how party or political affiliations largely influence the degree of concern expressed by others. (Saad, 2015; Toth, 2018 and the Economist, 2019). For instance, the percentage of voters who were identified as 'very concerned' about climate change, remained under 40% where it's been for 2 years while, until recent times, about a third of the populations that participated in the survey, believes that there have been a large degree of exaggeration on the subject of global climate change. While those without an opinion of the climate change issues continue to drop, as indicated in (Figure 6). The data in (Figure 7) indicates that democrats are far disposed to take the subject of climate change very seriously unlike Republicans, as indicated in (Figure 7). Though the world had recorded very serious and unprecedented natural disasters, it was observed that the phenomenal event had little or no marked effect on the public, as indicated in both (Figures 6 and Figures 7).

Figure 6. The conflicting opinions of global warming



Source: Gallup. Note: In 1997, this was asked of a half sample.

Figure 7. Party orientation of global warming



Source: American Psychologist (Weber and Stern, 2011).

Major Impediments to Acceptable Government and Political Action/Legislation

While the various factors influencing the kind of opinions expressed by electorate's and other citizens of several party affiliations, regarding the subject of climate change crisis - as discussed in the above section - it is also important to identify and evaluate those factors that seem to militate against governments' ability for addressing the problems of climate change, irrespective of the severity of the climate crisis that has been established since the turn of the 21st century. Some of the most discussed factors which fall into this category include: (1) The factors of trust and imagination, (2) The factor of collective action, (3) the factor of jurisdiction and accountability and (4) The factor of complexity. For want of space, point 3 and 4 (Factors of Jurisdiction & accountability and Factors of Complexity) will only be evaluated here seeing that they are some of the most influential factors impeding governments' efforts at addressing the challenges of global climate crisis.

The factor of jurisdiction and accountability is another very important factor which studies reveal (Kamarch, 2019), acts as one of the pertinent impediments hindering political and appropriate legal actions against the government on global climate change issues. Jurisdiction here is referred to as the territory within which a court or government agency may properly exercise its power." (The Legal Information Institute LII, 2019), the main problem here is the problem associated with identifying the appropriate jurisdiction for certain 21st centuries issues such as cyber security and climate change. Where a case in point is known, it becomes possible to establish appropriate jurisdiction. In the same vein, it also became feasible to establish laws, rules and the appropriate mechanism to hold people accountable for adherence or defaulting these laws and regulations. Where no clear case can be made for jurisdiction, then every person because accountable, in the reals sense, no one is accountable.

For example, how do you hold one (a Russian) accountable who engages in a cyber-crime, who currently lives in Ghana but routs his attack through France and Canada, which is, assuming you can really identify such people? In the same vein, who will you hold accountable for the great floods in Japan and Tokyo, the great coal mining factory in Australia, or the one situated in Russia?

In the same vein, there seems to be no clear legal architectural framework that allows authorities to punish or reward those who take very bold steps towards ensuring that their GHG emission levels are either increased or decreased. Further studies reveal (Hamilton, 2005 and Fu, Kalkanci, & Subramanian, 2018) that Greenhouse has a way of affecting people very far away from the very source where the fossil fuels are extracted from. Consequently, the delicate link between jurisdiction and accountability continues to be that weak link that makes it difficult, if not hard for governments' to propound policies and appropriate legal frameworks that should sustain the quest for strengthening the campaign and fight targeted at addressing the present global climate crisis.

The factor of complexity features more prominently as one of the factors inherent in the climate change problem, a factor that has also been identified to militate against finding viable public policy solutions to climate change crisis. Some of the established causes of global warming include the emission of the following substances into the earth's atmosphere: nitrous oxide, methane and carbon dioxide to mention but a few. As the earth warms, it in turn sets several other condition in motion such as: glaciers, increased rainfall, evaporation, increase in sea level, increase in wind speed and a couple of other natural phenomenon which in many ways, are known to affect weather patterns all over the world. Unlike the earlier generation of environmental problems, where it was easier to make simple connections with the smelling nature of the river with dead fishes appearing on the surface of the water or with oil spillage from a nearby factories, it was difficult for the new generation environmentalists' to find visible and rational connections with the coal plate exploration in Australia for instance, with the hurricane taking place in japan. As such, the new generation of environmentalists have problems with drawing the connection between the causes and effects of global warming. Evidence provided to support this claims were drawn from the results obtained from a survey found in the research conducted by Gallup, between1989 - 2019 (Gallup, 2019).

The results obtained from the survey indicated that those who participated in the survey could not help but express the complexity they experienced with the several encounters they had over

time, and what actions they resolved to take regarding what global warming and climate change were really all about. The results, as at 2019, indicated that people are becoming more troubled and worried about global climate issues, and the sudden rise in the number of people getting worried is understandably so. The results further indicates that those who really come to terms with issues causing climate change are way at the bottom of the chart, with regard to the factors believed to be the real causes of global climate change. It is from this premise that the complexities encountered in identifying the factors causing global climate change and the straight forward cause and effects of other global environmental issues are true. There is therefore, an urgent need for constant education for the purpose of enlightening the people about the real causes and effects of contemporary global climate changes. This need has become one issues that cannot be overemphasized.

THE PROBLEM WITH THE RISING DEMAND FOR GLOBAL ENERGY

With the geometric rise in the demand for global energy by the teaming earth's industries for the purpose of enhancing the living conditions of man, the world's climate has experienced a commensurate change in response to the accumulations of the GHG emissions which has amassed in great quantities in the earth's atmosphere since the turn of the 21st century. Studies like (The Hamilton Project, Brookings, and SIEPR, 2019; IEA, 2019; The Hamilton Project, 2019; Stevens, 2019; Clemente, 2020 and BBC, 2020) have reasons to believe that the demand for energy by humans mainly in the past two decades has exceeded the amount available for use locally (TOU, 2018). This has already been exemplified in (Figure 5). The report by the International Panel on Climate Change (IPCC) which released a rather shocking report that presented a global warming report of 1.5^0C, propelled scholars like (Hultman, 2018) to exclaim: "We are almost out of time".

This new report conducted by IPCC in Brookings (Nunn, O'donnell, Shambaugh, Goulder & Kolstad, 2019) focused on making known the kind of impact people should expect even from half of the warming reported (1.5 - 2 degree). The report observed that where this high degree of warming becomes the case – warming from 1.5^0 C to 2^0 C – it would result in scenarios where several millions of people will be exposed to dangerous and severe climate-related risks come 2050. This new turn of events will, for example, be responsible for annihilating over 99% of coral life forms (Hultman, 2018). Other areas to be affected include the Ecosystem, Human health, Sharp rise in sea level, communities, and livelihood generally. Hence, they recommended that except active steps are taken to activate and enforce strong policy actions on GHG emission in developed polities, the world would experience substantial biophysical damage which she may never recover from (The Hamilton Project THP, 2019 and Nunn, O'Donnell, Shambaugh, Goulder & Kolstad, 2019).

Some Facts About the Economic Effects and Consequences of Climate Change

This next section discusses and evaluates 5 of some of the fundamental economic effects arising from the rising demand for global energy in the world for the purpose of identifying viable solutions to the challenges of rising global energy demands. More specifically, closer attention is drawn to the economic consequences and outcomes of increasing demand for global energy in the US and in the African continent:

1. **Records revealed that continued rise in temperature of the atmosphere, as a result of GHG emissions, continues to have a hash toll on the US economy:** The authors make this assertion because they believe that with rising global temperatures comes coastal inundation, boisterous storm activities, high energy use, crime, high mortality rates and very low yield in agricultural products (Hsiang *et al*. 2017). The study conducted by (Hsiang *et al*. 2017) revealed that global temperatures recorded in the study were directly proportional to the economic cost implications exerted on the nation's economy. The study proved for instance that, where the global warming

rate for the US economy was placed at about 2^0C, by 2080 – 2099, It was projected that the US economy would have suffered an annual loss of about 0.5% of the GDP in the year 2080 – 2099 (Dell, Jones, and Olken 2012).

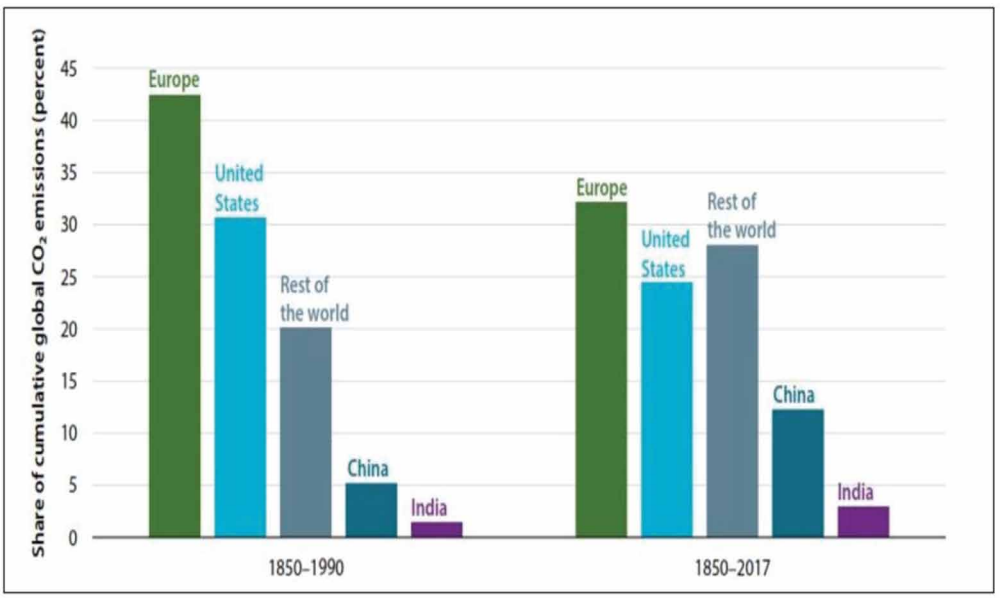
2. **The polities and economies that would be worst hit by climate change would be those US economies that are presently struggling:** While the effect of the climate change in the entire US economy will be evenly distributed amongst the entire economic landscape, those counties that have for a while struggled to keep up with the needs of their citizens and polity would be forced to suffer a much more severe impact, compared to others whose economies are on the average. The data provided by a study conducted by (Nunn, Parsons, and Shambaugh 2018) elucidates this fact. The study revealed that the US counties that stand the chance of being more adversely affected by the increasing GHG emission are the states that are predominantly located in the South and the Southwestern regions of the United States of America (Muro, Victor & Whiton 2019). For instance, the study by (Rao, 2017), from this premise, argued that over 2 million homes run the risk of being submerged under flood waters by the year 2100. States that will be affected in this category include Texas, South Carolina, North Carolina, Louisiana, and Florida. Those other countries located in the upper Midwest pacific region are shielded from these varying hash temperature and climate changes and the hazards that goes with them.
3. **On the global scale, low-income earning countries stand the chance of losing very larger shares of their economic outputs:** Established that pollutants arising from GHG emissions have far global reaching effects on the economies and countries beyond the borders from where they are originally emitted, for instance, it is also an established fact that GHG emission from the US largely affects the Chinese environment and vice-versa. However, some countries are much more exposed to the damage arising from global warming than other areas. For instance, it is known that an increased CO2 emission concentration in the US will have more per capita damage in India than it would have in Iceland. The study conducted by (Nunn, O'donnell, Shambaugh, Goulder, Kolstad, 2019) provided vivid data which adds credence to the fact that several regions which contribute little or no amount of the GHG emission-per capita, nevertheless, have been known to suffered a high proportion of climate change damage per capita.
4. **Majority of the countries in Africa and the Middle East will suffer some of the highest recorded mortality rate as a result of climate change:** Aside the reduction in economic output highlighted in (Figure 3), one very adverse effect of climate change manifests in high mortality rates. This is because, in the areas that are already known for normal high temperatures, climate change will further exacerbate heat-related health issues that will cause mortality rates to sower very high. The study by (Carleton *et al.* 2018) for instance, indicates that countries like Accra Ghana and Togo, which are situated in the equatorial region, are projected to have an additional number of 160 deaths per 100,000 residents. The case is not so for cooler regions like Oslo, Norway which have been predicted to have 230 fewer deaths per 100,000 residents. The same study revealed that the impact of high mortality rates will be worst felt in countries that are not economically buoyant to provide amenities that should aid in cushioning the effects of scourging high temperatures. On the other hand, those countries that are at the least economic scale/income will likely experience all the projected mortality rate feared to befall the region due to their geopolitical locations and the presence of poor economic infrastructure (Carleton et al. 2018; Deschenes and Moretti 2009).
5. **Energy and carbon emission intensity on the US economy is falling drastically:** It is important to highlight this one important factor before wrapping up discussion in this section. While the initial thesis proposed in this section held that rising demand for global energy resulted in high GHG emissions leading to hash economic consequences on the American economy, it is imperative to note that advanced technological innovations directed at improving the efficiency of the various sources of energy has yielded remarkable results in the past 2 decades. It is now a clear fact that substantial emission reduction is attainable, despite the rise in the demand for

energy and productivity. To affirm this fact, the study by (Bureau of Economic Analysis 2007–17; U.S. Environmental Protection Agency [EPA] 2007–17; Vasant, Zelinka, Weber, (Eds (2019) observed that between 2017 to 2019, carbon emission in the US fell 14% while energy outputs grew by 16%. (See data in Figure 8). The study further observed that the US energy intensity – referred to as energy consumed per dollar of the GDP – has continued to fall even in times of economic contraction and expansion. As such, the economy has continued to grow even though drastic reliance on energy use had fallen. This reality and argument have proven worthwhile for those mitigating about climate change damages (CEA 2017; Obama 2017). The enforcement of sound policy legislations is believed, will aid sustaining the reduction in emission that is steadily taking place (Rhodium Group 2019). Substantial efforts have been made to install non-hydro powered renewable energy which in turn has increased the number of electricity based energy by 4%, over a period of 2009 – 2018 (EIA, 2019).

Implications for Growing Electricity Demand

As noted earlier in the sections above, it's been projected that energy needs/consumption, between 2005 and 2030, is expected to have increased by 50% with the majority of demand emanating from developing countries. In the United Kingdom, for instance, renewable energy was known to have provisionally accounted for 8.5% growth. This is because between 2015 through 2019, renewable energy resources generation increased by 29%. With the rising demand for energy in most industrial areas and urban centers of the world, comes the pressure to meet with the various energy demands for powering industries, home appliances, vehicles, etc. Studies (IEA, 2019; Stevens, 2019 and BBC, 2020) revealed that energy shortages in developing countries could result to various hazardous situations and circumstances, as was the case in Iraq, when after the war, the entire government was brought to a standstill when insurgents attacked electricity insulations, thereby resulting to a massive

Figure 8. CO2 Emission by Geographic Regions of the World



Source: Obtained with the kind permission of the study by (Ritchie and Roser, 2017) in (The Hamilton Project, Brookings, and SIEPR, 2019)

shortage of energy supply for weeks. Even in times of peace, a place like the Dominican Republic could experience serious conflict scenarios where and when they ever experience any kind of shortage in their eclectic sector.

Recent studies observed that about 600 million individuals living in the African continent do not still have access to modern energy. The study predicted that Africa and its inhabitants would remain in the dark until about 2080 when it is projected that its citizens will then have access to reliable and constant electricity. The report by (APP, 2015) indicates that about half of the electricity generated in Nigeria and in Ghana are either lost or stolen as a result of poor electricity infrastructure.

As a result of the astronomic growth in the demand for electricity in African and in most developing countries of the world, great pressure is exerted on the very short supply made available to the masses for their private use and for the industries. Consequently, the insufficient and mostly, lack of electricity supply in a given polity, as indicated in (Figure 3) has the capacity to do the following in any polity: (1) Prevent situations that would bring about dynamic growth, (2) Inhibit the building of inclusive societies, (3) Hampers whatever efforts made towards the eradication of poverty, (4) Impede the degree of progress envisaged to be attained amongst health workers towards preventing and curing several curable and preventable diseases. (5) Jeopardize children's schooling and their opportunity to shield themselves from poverty that comes from not getting qualitative education.

The various consequences arising from the pressure of the rising demand for global energy as indicated above has inimical consequences that could eventually lead to chaotic situations if drastic actions are not taken on time to abate them.

New Technologies and Viable Policy Implementations

Arising from the review about the possible implications emanating from the rising demand for global energy in Africa and in other parts of the world, the subject that often occupies the mind of researchers at this stage is the questions of what best measures should be taken to aid addressing the problems causing climate change? Why have previous suggestions/solutions offered for addressing the problem of climate change proven not to be efficient or inadequate for addressing the climate change crisis?

Some of the strong suggestions that have been proffered as ways for addressing climate change crisis issues are the focus of this section of the paper. It shall be discussed under two sub-headings:

1. The adaptation and implementation of 21st century technological innovations.
2. The formulation viable government policies that are devoid of bipartisan sentiments.

Adaptation and Implementation of 21st Century Technological Innovations

An evaluation of the need for an urgent adoption and implementation of recent technological innovations of the 21st century for addressing climate change issues has been considered a positive and germane move by most scholars (Wogu, *et al*, 2018; Wogu, *et al,* 2019; Victor, 2019 & Wogu et al, 2020). These scholars among other things, argued that the adoption of technological innovations of the 21st century for the purpose of trying to address climate change issues has, for instance, been regarded as one of the reasons why the demand for oil began to drop remarkably as indicate in (Figure 8). The data provided by (Figure 8), reveals a remarkable degree of reduction in the demand for oil as a result of the fact that most industrialized nations of the world have taken very bold technological advanced steps towards ensuring that they drastically reduce the volume of GHG emission released into the earth's atmosphere. This they had undertaken by using advanced technological innovations to identify other ways of providing the required energy for their industries and for man's daily needs while reducing the volume of GHG emission that was initially instrumental to the hazardous climate change experienced recently. Some of the new alternative sources of energy identified and made possible via technological innovations include: Solar Power Energy, Wind Power Energy, etc. As a result of the adoption of these technological innovations, there is now a great deal of fuel-efficient products

and machines that run on little or no fuel. There is also the introduction of Artificial Intelligence technologies now utilized for analyzing real-time data for climate change (Wogu, *et al*, 2018; Wogu, *et al,* 2019; Victor, 2019; Vasant, Zelinka, Weber, 2019 and Wogu et al, 2020) and electric vehicles (Stevens, 2019) which together have drastically reduced the inimical volume of GHG emission that had been identified as responsible for all the drastic climate changes recently experienced globally.

Formulating Viable Government Policies That are Devoid of Bipartisan Sentiments

One other factor that has been identified as tangential to providing new directions and pathways for addressing the rising climate change issues, is government's ability to provide - even in such drastic times which most countries find themselves - viable government policies guide/regulations that are devoid of bipartisan bias and political sentiments. The remarks by Mr. Fatih Birol, the IEA executive director of the World Energy Outlook, adds credence to this view:

What comes through with crystal clarity in this year's World Energy Outlook is that there is no single or simple solution to transforming global energy systems... We need strong leadership from policymakers, as governments hold the clearest responsibility to act and have the greatest scope to shape the future (IEA, 2019).

Most scholars of global climate change believed that it had become pertinent that Governments' take hard and drastic evidence-based look at where their polities stand on matters of climate change and from there, carefully decide which foot to put forward, bearing in mind that they stand to face the consequences and implications of whatever wrong or right choices they decide to make regarding the provision of viable policies for directing the course of global climate issues in the 21st century. Other scholars whose opinions are in line with this position include those of (Wogu, Sholarin & Agoha, 2015; Kamarch, 2019; Rachman, 2019 and Nunn, O'Donnell, Shambaugh, Goulder & Kolstad, 2019). They were all unanimous in the opinion that substantial biophysical damages will continue to occur on earth when there continues to be an absence of a strong climate policy action by leaders in the position of authority.

DISUCSSIONS OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

Specific Research Findings

Regarding the 1st research objects which sought to identify the pertinent factors responsible for the rising number of life-threatening climate change cases reported by famous research institutions around the globe, the authors observed the following: (1) that the problem of the Complexity and Jurisdiction & Accountability were some of the main factors that have hindered the required understanding of research in global climate change, (2) that while there are several different notions about the real causes of climate change, the rising degree of GHG emission which saturates the earth's atmosphere with an unprecedented amount of CO2, was in the study identified to be one of the main causes of the rising cases of global climate crisis recently taking place in the world. (3) There was also the belief that the hazards associated with global warming are often exaggerated or underestimated. (4) It was also observed that a high degree of the absence of a strong policy actions on the part of governments – orchestrated by the bipartisan behavior exercised by political and government officials on how best to address and combat climate change issues as indicated in (Figure 7) - was identified as another pertinent factor behind the rising cases of global climate crisis in the 21st century (Smith and Mayer, 2018).

On the 2nd research objective which sought to identify and interrogate the reasons for the existence for the various polarized views on climate change exhibited by citizens, the electorates and top government functionaries, the authors observed that economic and social reasons were at the root of

the polarized behaviors observed to exist amongst citizens as indicated in (Figures 3, 4 and Figures 5). Consequently, the wide polarized views about climate change have widened the bipartisan support for an expanded energy source.

On the 3rd research objective which sort to identify the most viable ways for addressing the global climate crisis, the paper applauds the increasing awareness and sensitizations that has been raised to a whole new level among world leaders at conferences like the just concluded 2020 World Economic Forum which took place in Davos, Switzerland, were the subject of 'global climate change' was top on the agenda. The adoption of technological innovations however, would expedite action towards identifying sustainable and renewable energy resources that would aid meeting the rising demand for more energy, while effectively reducing the level of GHG emission that are released into the earth's atmosphere, (as indicated in Figures 3 and Figure 8). Electricity, wind, and solar energy were here identified as some of the viable energy recourses through which this objective can be attained.

Recommendations

Regarding the above specific findings made from this research, the authors find the following recommendations necessary for advancing and actualizing the objectives proposed at the beginning of the research:

1. On the 1st research question and objective, the authors recommend that there be a concerted and targeted effort at educating the masses on the subject of global climate change as this will go a long way to dispelling the complexities, misconceptions and the problem of jurisdiction and accountability, whose absence in polities currently accounts as major hindrances to the various research on going on 'Global climate change crisis'.
2. With the abundance of CO2 emanating from GHG emission, identified as one of the key climate change influencers, Government is expected to expedite actions directed at legislating on policies and laws that should – via monetary sanctions of certain amounts of dollars' to the percentage of CO2 emitted into the atmosphere – serve as sanctions and deterrents to advanced economies and industries who's heavy industrial activities are responsible for emitting chunks of CO2 into the earth's atmosphere, amidst the drive the world is making towards drastically reducing its GHG emission.
3. On the problems arising from the polarized views identified to be inherent amongst the electorates, political affiliations and citizens generally, the government is advised to strive to have a common front they can always agree on without which, there will always be impediments that would become the basis of further arguments that would slow down the process of formulating viable policies and laws that would aid addressing the climate change crisis.
4. While the authors here in the paper advocate for an intensified sensitization program for the purpose of creating more awareness for the masses, the electorates, political affiliations, world leaders are enjoined to hold forums regularly for the sole purpose of deliberating on issues of climate change, etc., A case in point is seen in the just concluded Year 2020 World Economic Forum' which took place in Davos.
5. Government is admonished to adopt 21st century innovations in Artificial Intelligence (AI) and ICT as this would not only identify new ways of discovering new sources of energy like Wind power, Solar power, Electricity, etc., sources that would ensure the rapid reduction of GHG emitted into the earth's atmosphere as indicated in (Figure 8).

CONCLUSION

While this paper set out to investigate the extent to which politics play a role in influencing the kind of climate change that the earth and its inhabitants experience, the authors of this paper found substantial reasons and evidence to believe that, apart from other factors like the problem of jurisdiction - with

regard to the geopolitical regions and locations of countries and industries from where more CO2 are produced and emitted into the earth's atmosphere, and the problem of the complexity of the subject of climate change and what people are willing to accept as the real causes and cure of climate change - there is the real problem of the lack of trust in the government of the day. This lack of trust, most researchers and scholars of the 21st century argued (IEA, 2019), is one of the fundamental barriers identified with the capacity to militate against the effective and prompt execution of environmental actions and policies proposed for implementation on the problem of climate change.

Thus, to adequately combat global climate change crisis in the 21st century, there is the need for all concerned parties and agencies to embark on a collective actions that will tackle the problem of climate change on many fronts, nationally and internationally, party or political affiliations notwithstanding.

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