NAVIGATING THE ENERGY TRANSITION: OPEC, CLIMATE CHANGE AND THE FUTURE OF RENEWABLE ENERGY LAW

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Abstract
The global energy landscape is undergoing a significant transformation in response to the pressing challenge of climate change. As a major player in the energy sector, the Organisation of Petroleum Exporting Countries (OPEC) plays a crucial role in shaping the future of global energy. This paper explored the intersection of OPEC, climate change and renewable energy law and identified the challenges and opportunities inherent in the energy transition. Through doctrinal analysis of existing laws, policies and literature, this research examined the historical context of OPEC, the causes, threat and dynamics of climate change. Findings highlighted the need for coordinated global response to climate change, with OPEC's role being critical in facilitating the transition to a low-carbon economy. The analysis revealed some inconsistencies in OPEC's rhetoric on climate change and underscores the imperative of robust legal framework to support the growth of renewable energy. These findings necessitated recommendations including the need for more collaborative approach from OPEC and other stakeholders to accelerate the energy transition. The paper further emphasised the essentials for a coordinated effort to mitigate the impacts of climate change and promote a sustainable energy future.

Key words: OPEC, Climate Change, Renewable Energy Law, Energy Transition.

1.0 **Introduction**

The greatest and most fundamental challenge facing the world today may not necessarily be the war in Ukraine or the crisis in Palestine, Syria, Ethiopia, Yemen or Libya; in fact it is neither the Refugee crisis nor the unceasing menace of the Boko-Haramites - it may as well be climate change! The global community, having tasted the bitter and unforgiving wrath of climate change, in recent time, got to work, and have come up with several mitigating and ameliorating efforts culminating in several national and international laws and policies necessitating the adaptation of resources and commitments from state actors, governmental and nongovernmental organisations and other stakeholders towards meeting the peculiar challenges thrown up by the menace of climate change. The Organisation of Petroleum Exporting Countries (OPEC) featured prominently in the matrix of the climate change discuss because of its cardinal role and prominent status as a body made up of states whose major sources of revenue flow from the very prominent and most visible contributing factor to global warming and climate change- the fossil fuel. The world is on all fours as to the need for the reversal of over-dependence on oil as source of energy and urgent attention is directed towards diversification, alternative energy and the ultimately phasing out fossil fuel which is replaceable by renewable energy.

The success of this commendable adventure will ensure a safe and healthy habitat for the present occupants of the earth and sustain future generation. However, this development, no doubt poses serious threat to the economic and political equilibrium of OPEC Member states that were being mandated to cut down on carbon emission and creatively advance technologies for safer exploration and production of oil while investing on

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renewable energy. This state of affairs placed before OPEC Members a 'healthy dilemma' which resulted in the noticeable ambivalence of some of its members in the climate change politics. This article beams its searchlight on OPEC using the lens of climate change to highlight her contributions and failings in this pertinent and worthy goal of making our world safer again by moving away from fossil fuel and cutting down carbon emission while giving renewable energy the prominence it urgently deserves. The article also x-rays the various national and international legal frameworks available on climate change while drawing attention to OPEC Member defaulters on international agreements relating to cutting tilting greenhouse gases. It also delved into the various species of alternative energy highlighting their peculiar benefits and challenges in the way of their adoption. Recommendations and suggestions were proffered to arrest the noticeable inertia on the part some OPEC members in the implementation of Climate Change Agreements.

1.1 **Brief History of Opec**

The Organisation of Petroleum Exporting Countries (OPEC) is a permanent intergovernmental organization of oil-exporting developing nations that coordinates and unifies the petroleum policies of its member countries. This international organisation seeks to sustain the stabilisation of oil prices in the international oil markets, in order to eliminate harmful and unnecessary fluctuations, while taking into account at all times to the interests of oil-producing nations with a view to securing a steady income for them.[4] OPEC was created at the Baghdad Conference on September 10-14, 1960. At inception, five countries were signatories to the agreement that birthed the body, viz: Iran, Iraq, Kuwait, Saudi Arabia and Venezuela.[5] The founding members were later joined by nine other members: Qatar (1961); Indonesia (1962)- which suspended its membership in January 2009 and later reactivated it in January 2016 and suspended it again in November 2016; Libya(1962); United Arab Emirates (1967); Algeria (1969); Nigeria (1971); Ecuador (1973) which suspended its membership in December 1992 and later reactivated it in October 2007; Angola (2007); and Gabon (1975)- which terminated its membership in January 1995 and later re-joined in July 2016.[6]Angola withdrew its membership on January 1st, 2024.[7] In the first five years of its existence OPEC was headquartered in Geneva, Switzerland, this was later moved to Vienna, Austria, on September 1, 1965.[8] The major objective of the body is to co-ordinate and streamline, petroleum policies among member countries, in order to secure fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the industry.[9]

1.2 **The Challenge of Climate Change**

Climate change, which is also referred to as global warming, is the rise in the average surface temperatures on earth. The aggregate of scientific consensus agree that climate change is due primarily to the human use of fossil fuels, [10] in addition to other human activities, which releases carbon dioxide and other greenhouse gases (GHGs) into the air. These gases trap heat within the atmosphere, which can have a range of effects on the ecosystems. These effects include: rising sea levels due to melting of the polar ice caps; warming ocean temperatures with stronger and more frequent storms; additional rainfall, particularly during severe weather events, leads to flooding and other damage; droughts which sometimes render landscapes to wildfires,

[4] Joint Organisation Data Initiative, Coordinated by the International Energy Forum, '*Organisation of the Petroleum Exporting Countries (OPEC),'* available at https://www.jodidata.org/about-jodi/partners/opec.aspx accessed on 20 March, 2025.

[5] Organisation of the Petroleum Exporting Countries, '*Membership Countries*,' Available at https://www.opec.org/opec_ web/en/about_us/25.htm accessed on 20 March, 2025.

[6] Ibid. (n5)

[7] Organisation of the Petroleum Exporting Countries, '*Membership Countries*,' Available at https://www.opec.org/opec_ web/en/about_us/25.htm accessed on 20 March, 2025.

[8] Ibid.

[9] Ibid.

[10] According to NASA, cumulative of this consensus suggests nothing other than above submission. This was informed by the aggregate submissions by 18 scientific bodies such as: American Association for the Advancement of Science; Intergovernmental Panel on Climate Change (IPCC); American Geophysical Union (AGU), etc. See, National Aeronautics and Space Administration NASA, 'American Scientific Consensus,' published October 21, 2024. Available at https://science.nasa.gov/climate-change/scientific-consensus/ accessed on 5 July, 2025.

threatening habitats, homes, and lives; heat waves which contribute to human and animal deaths; severe risks to wildlife, thereby increasing the numbers of endangered species, among other adverse effects.[11] The National Oceanic and Atmospheric Administration (a U.S Department of Commerce)[12] highlighted the impacts of climate change in the following sublime but emphatic ways: water resources impact life in diverse ways, as patterns of where, when and how much precipitation falls are transforming the way we live. Food supply is inextricably connected to climate and weather conditions, as higher temperatures, water stress, extreme weathers, etc., pose challenges to farmers and ranchers. This ultimately impacts food production and food security.

1.3 **Causes of Climate Change**

It is a settled fact that the primary causes of climate change is the burning of fossil fuels, such as oil and coal, which emits greenhouse gases (GHGs) into the atmosphere- primarily carbon dioxide. However, other critical human activities, such as agriculture and deforestation, also contribute to the proliferation of the greenhouse gases that cause climate change[13]. Some quantities of these gases are naturally occurring and critical part of earth's temperature control system, however, the atmospheric temperature of CO2 did not rise above 300 parts per million between the advent of human civilisation roughly 10,000 years ago and 1900. Today, it is about 400ppm, a level not reached in more than 400, 000 years[14].

1.4 **Threats Inherent in Climate Change**

Climate change is one of the greatest threats facing human health today. As temperature and precipitation patterns change, the delicate balance of climate, weather events and life is disrupted. Unfortunately, few people are aware of the grave impact climate change has on their health, even as these health effects are wide spread and serious. Diseases, injuries and loss of life can result from climate-induced natural disasters, heat related illnesses, pest and waterborne diseases, air and water pollution and damage to crops and drinking water sources.[15] Children, the poor, the elderly, and those with a weak or impaired immune system are especially vulnerable.[16] These threats have, over the years galvanised the international community into action to slow and eventually reverse climate change. This invariably, means slashing fossil fuel consumption and greenhouse gas (GHG) emissions; shifting to clean renewable energies, and preparing the world for the degree of climate change that will come by financing improvements in public heath infrastructure and practice, disease surveillance, and emergency response capabilities[17].

1.5 **Renewable Energy; What is Renewable Energy?** Renewable energy is energy that is generated from natural processes that are continuously replenished.[18] This includes sunlight, *geothermal heat,*[19] wind, tides,

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[11] See, Savannah Bertrand,' Fact Sheet I Climate, Environmental and Health Impacts of Fossil Fuels,' Environmental and Energy Study Institute (2021). Available at https://www.eesi.org/papers/view/fact-sheet-climate-environmental-and-health-impacts-of-fossil-fuels-2021 accessed on 5 July, 2025.

[12] The National Oceanic and Atmospheric Administration (NOAA), 'Climate Change Impacts,' (2025). Available at https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts Accessed on 7 July, 2025.

[13] Ibid.

[14] Ibid (n5)

[15] Intergovernmental Panel on climate Change (IPCC), 'Climate Change, a Threat to Human Wellbeing and Health of the Planet. Taking action Now Can Secure our Future.' Available at https://www.ipcc.ch/2022/02/28/pr-wgii-ar6/ Accessed 15 July, 2025; see also, European Environmental Agency, 'Climate Change Impacts, Risks and Adaptation,' (2025). Available at https://www.eea.europa.eu/en/topics/in-depth/climate-change-impacts-risks-and-adaptation Accessed on 7/15/2025 ; See also, World Wildlife Fund, 'Effects of Climate Change.' Available at https://www.worldwildlife.org/threats/effects-of-climate-change accessed on 14 July, 2025.

[16] Ibid.

[17] Ibid.

[18] Johns Hopskin School of Advanced International Studies, 'Renewable Energy and Sustainable Energy; what is the Difference?' (2025) Available at https://energy.sais.jhu.edu/articles/renewable-energy-vs-sustainable-energy/ Accessed on 14 July, 2025.

[19] Ibid.

water, and various forms of biomass.[20] This energy cannot be exhausted and is constantly renewed (naturally replenished).[21] Renewable energy technologies range from solar power, wind power, hydroelectricity/micro hydro, biomass and biofuels for transportation.[22]

2.0 **The Dynamics of Renewable Energy**

2.1 **The Sun**

Most renewable energy come either directly or indirectly from the sun. Solar energy can be adapted for varieties of domestic and industrial purposes. It may be used directly for heating and lighting homes and other buildings, for generating electricity, and for hot water heating, solar cooling, and a coterie of industrial or commercial uses.[23]

2.2 **The Wind and Water**

Solar, wind and hydro energy share mutual interconnectivity in their nature, production, distribution and utilisation. The sun's heat drives the winds, the wind's energy is in turn captured with wind turbines. The wind's and the sun's heat also cause water to evaporate. When this water vapour turns into rain or snow and flows downhill into rivers or streams, its energy can be captured using hydroelectric power to produce electricity.[24]

2.3 **Biomass**

The combined efforts of rain, snow and sunlight account for the growth of plants. Biomass is composed of the organic matter that makes up plants. Through the adoption of certain technology biomass can be used to produce electricity, transportation fuels, or chemicals. The adaptive use of biomass for any of these purposes and other related energy usage is called *bioenergy*.[25]

2.4 **Hydrogen Gas**

Hydrogen, said to be the most abundant element on earth, is found in many organic compounds, such as water. However, this element does not occur naturally as a gas. It is always combined with other elements, such as oxygen to form water. When it is separated from another elements, hydrogen can then be burned as a fuel, and it may also be converted into electricity.[26]

2.5 **Geothermal Energy**

It is interesting to note that not all renewable energy resources are acquired from the sun. *Geothermal energy* utilises the earth's internal heat for a variety of uses which: cooking, the generation of electricity, heating

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[20] Biomass is a renewable organic matter. We have used biomass energy, also known as "bioenergy"- the energy from plants and plant-derived materials-since people began burning wood to cook food and keep warm. Other sources of biomass include: food crops, grassy and woody plants, residue from agriculture or forestry, oil rich algae, and organic components of municipal and industrial wastes. Even the fumes from landfills (which are methane, the main component in natural gas) can be used as biomass energy source. The use of biomass can reduce dependence on oil because biofuels are the only renewable liquid transportation fuels available. See ECOSTA, 'Biomass as an Alternative to Fossil Fuels: Advantages and Future Opportunities,' (19 February, 2025). Available at https://www.ecostan.com/blog/biomass-as-an-alternative-to-fossil-fuels-advantages-and-future-opportunities Accessed on 14 July, 2025.

[21] Johns Hopskin School of Advanced International Studies, 'Renewable Energy and Sustainable Energy; what is the Difference?' (2025) Available at https://energy.sais.jhu.edu/articles/renewable-energy-vs-sustainable-energy/ Accessed on 14 July, 2025.

[22] Ibid.

[23] Ganesh Karbhari and Pragya Nema, 'Adaptive Solar Energy System based on Internet of Things,' International Journal for Research in Applied Science and Engineering Technology, (March 2020) Vol. 8 Issue 2. Available at https://www.researchgate.net/publication/340311182_Adaptive_Solar_Energy_Management_System_based_on_Internet_of_Things Accessed on 14 July, 2025

[24] Ibid.

[25] Repsol Global, 'Energy from Biomass Conversion,' (2025). Available at https://www.repsol.com/en/energy-and-the-future/sustainable-mobility/bioenergy/index.cshtml Accessed on 15 July, 2025.

[26] Department of Energy, 'Hydrogen Fuel Basics.' Available at https://www.energy.gov/eere/fuelcells/hydrogen-fuel-basics Accessed on 15 July, 2025.

systems and cooling of buildings. This is a type of renewable energy taken from the earth's core. It comes from heat generated during the natural formation process of earth through the radioactive decay of materials. Geothermal energy is stored in underground in rocks and fluids in the core of the earth.[27]

2.6 **Tidal Energy**

The energy of the ocean tides come from the gravitational pull of the moon and the sun upon the earth. In fact, ocean energy comes from a number of sources. There is the energy of the oceans waves, which are driven by both the tides and the winds. The sun also warms the surface of the ocean more than the ocean depths, creating a temperature difference that can be used as an energy source. All these forms of ocean energy can be explored to produce electricity.

3.0 **The Legal Framework on Climate Change**

The need for common strategy and binding targets defined on a planetary scale to combat the menace of climate change led the international community to make concerted efforts to put in place appropriate legal and institutional framework to cater for issues relating to the menace of climate change.[28] Although the regulation of climate change is anchored on a complex network of international, regional and domestic legal frameworks, while global treaties set the foundation for coordinated action, their effectiveness depend on the extent to which state parties, including members of the Organisation of Petroleum Exporting Countries (OPEC), incorporate such obligations into national laws and policies. The international community's efforts to legislate on climate change substantially revolves around the United Nations Framework Convention on Climate Change (UNFCCC) and the associated agreements, such as the Kyoto Protocol, the Paris Agreement, etc. A range of national and international legal theories have been put forward by different organisations, communities and individuals, such as human rights law, constitutional law, emission control regulation, endangered species protection, freedom of information and international legal obligations.[29] These efforts basically aim to stabilise greenhouse gas emission and the concentration in the atmosphere and to prevent dangerous human interference with climate system. This section reviews key legal instruments at the international, regional and domestic levels, highlighting their implications for OPEC member states. A number of greenhouse gas regulations have emerged in many Jurisdictions to deal with climate change. These are emission trading schemes including the Kyoto Protocol,[30] the E.U. Emission Trading Scheme,[31] the U.K Emission Trading Scheme,[32] and U.S state and regional emission trading programmes.[33] As such, climate change is given priority importance by organisations, government, nongovernmental and private sector

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[27] TWI, 'What is Geothermal Energy? How does it Work?' Available at https://www.twi-global.com/technical-knowledge/faqs/geothermal-energy Accessed on 15 July, 2025.

[28] Planet Energies,' International Efforts to Combat Climate Change'. Available at https://www.planete-energies.com/en/media/article/international-efforts-combat-climate-change Accessed on 15 July, 2025.

[29] Ngozi Uzoka and others, 'Legal Frameworks for Addressing the Impacts of Climate Change in Countries Across the World,' Nnamdi Azikiwe University, Awka Journal of Private Property Law, (2024) Vol. 1 (2) https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://journals.unizik.edu.ng/naujppl/article/download/4384/3572/9989&ved=2ahUKEwjL7LTiyryOAxXGYEEAHYmXEWsQFnoECEwQAQ&usg=AOvVaw3Ecm37z2qF2vHevr1g6rdj Accessed on 15 July, 2025

[30] The Kyoto protocol extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that commits state parties to reduce greenhouse gases emission.

[31] It is world's first emission trading system. See, European Commission, 'Climate Action,' Available at https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en Accessed on 15 July, 2025.

[32] International Carbon Action Partnership (ICAP), 'UK Emission Trading Scheme.' (2021) Available at https://icapcarbonaction.com/en/ets/uk-emissions-trading-scheme Accessed 15 July, 2025

This is responsible for the choice of EU member states' auctioning, benchmarking, and new entrant provisions in allocation of CO2 cut.

[33] See, Environmental Protection Agency (EPA), 'What is Emission Trading?' Available at https://www.epa.gov/emissions-trading/what-emissions-trading Accessed on 15 July, 2025.

participants.[34] The latest effort on climate change is Paris Agreement in December 2016.[35] Some of these efforts are as follows:

3.1 **International Frameworks**

3.1.1 **United Nations Framework Convention on Climate Change (UNFCCC), 1992**

This international agreement on climate change was opened for signature at Rio de Janeiro in 1992 at the United Nations Conference on Environment and Development. The agreement recognises that developed and developing countries have 'common but differentiated responsibilities and respective capabilities (CBDR-RC).' Its cardinal objective is the stabilisation of greenhouse gas in the atmosphere at a level that would be less harmful and prevent adverse interference with the climate system.[36] it acknowledges that while all states share responsibility for addressing climate change, developed countries must take the lead given their reputation on level of emissions. All OPEC member states are parties to the UNFCCC.

3.1.2 **Kyoto Protocol, 1997**

The Conference of Parties is a law making body established by the UNFCCC which meets annually to devise ways of implementing UNFCCC goals. At the COP meeting in Japan in 1997, *the Kyoto Protocol*[37] was negotiated and came into force in 2005. The COP sets binding emissions limitations on developed countries that have signed it. The Kyoto Protocol introduced binding greenhouse gas (GHG) emission reduction commitments for developed states. OPEC members were committed through reduction in demand for for fossil fuels and the emergence of emission trading schemes such as the EU Emissions Trading System (EU ETS).

3.1.3 **Paris Agreement, 2015**

The Paris Agreement fundamentally restructured global climate obligations by requiring all states to submit Nationally Determined Contributions (NDCs), reflecting their national climate ambitions. OPEC member states such as the UAE, Nigeria, Saudi Arabia and Kuwait have all submitted NDCs, but their levels of ambitions vary significantly.[38] Article 6 further allows states to engage in cooperative mechanisms and carbon markets, thereby creating potential opportunities for oil-dependent economies to diversify through investment in renewable energy.[39]

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[34] Ibid (n33)

[35] The Paris Agreement is within the UNCCC dealing with greenhouse gases emission mitigation, adaptation and finance starting in the year 2020. As of December 2016, 194 UNFCCC members have ratified the Treaty. The agreement went into force on 4 November, 2016. It provides opportunity for countries to strengthen the global response to the challenge of climate change through keeping a global temperature rise this 21st century below 2 degrees Celsius and to limit temperature increase even further to 1.5 degree Celsius. See, United Nations, 'Sustainable Development Goal 13,' Available at https://www.un.org/sustainabledevelopment/climate-change/#:~:text=COP21%2C%2012%20December%202015%20The%20Paris%20Agreement,will%20reduce%20emissions%20and%20build%20climate%20resilience. Accessed on 15 July, 2025.

[36] See, the IISD Earth Negotiation Bulletin, 'United Nations Framework Convention on Climate Change – UNFCCC,' Available at https://enb.iisd.org/negotiations/un-framework-convention-climate-change-unfccc Accessed on 15 July, 2025.

[37] The Protocol aimed to reduce emission to about 30% below what would have occurred under a 'business as usual' atmosphere. It also provides flexibility for each country to make its own decision on how to reduce emission. The key feature of the protocol is its binding emission commitments by state parties. See, MyClimate, 'What is the Kyoto protocol?' Available at https://www.myclimate.org/en/information/faq/faq-detail/what-is-the-kyoto-protocol/ Accessed on 15 July, 2025.

[38] International Institute for Sustainable Development, How the Transition Away From Fossil Fuels Production can be Included in New Climate Commitments and Plans, 2024. AvailableAvailble at <https://www.iisd.org/system/files/2024-06/fossil-fuel-transition-new-climate-commitments.pdf>

[39] Ayomikun David Ajayi and others, Exploring Voluntary Carbon Market as a Tool for Sustainable Agriculture in Nigeria: Opportunities and Challenges, Scientific African. Available at <https://www.sciencedirect.com/science/article/pii/S246822762500393X> Accessed on 19 August, 2025.

3.1.4 **Conference of the Parties (COP) Decisions**

The annual COP meetings adopt decisions that substantially guide implementation of the UNFCCC and Paris Agreement. For instance, COP28 (Dubai, 2023) concluded the first 'Global Stocktake,' explicitly calling for a transition away from fossil fuels. However, OPEC as an organisation oppose strong words on fossil fuels phase-out.[40] This underscores the tension between collective climate ambitions and OPEC' members' oil based economic interests.

3.2.0 **Other Relevant International Instruments**

3.2.1 **Rio Declaration, 1992**

The Rio Declaration on Environment and Development, which was adopted at the United Nations Conference on Environment and Development (UNCED) held in 1992, is a foundational document on sustainable development. It consists of 27 guiding principles which stresses the need to balance economic growth, social development and environmental protection which forms the fulcrum of its Principle 7 that establishes the concept of Common but Differentiated Responsibilities (CBDR). This principle holds that while countries share responsibility for global environmental protection, developed countries have a greater obligation due to their historical contributions to environmental degradation and their superior technological and financial capacities. This recognition impacts climate negotiations, influencing agreements such as the Kyoto Protocol and the Paris Agreement.[41]

Another relevant element is Principle 15, which embodies the Precautionary Principle. This asserts that where there are threats of irreversible environmental damage, the lack of full scientific certainty should not be used as a reason to delay cost-effective measures to prevent degradation. This places emphasis on preventive action and has been relevant in areas such as climate change, chemical regulation and biodiversity conservation.[42] These two principles highlight the Rio Declaration's dual focus on ensuring fairness in global responsibilities while encouraging proactive action in the face of uncertainty, shaping global perspective on international environmental law and policy.

3.2.2 **Montreal Protocol, 1987**

The Montreal Protocol on Substance that Deplete the Ozone Layer, adopted in 1987, sets precedent for global cooperation on phasing out harmful substances. It is one of the most successful international treaties.[43] It was designed to protect the ozone layer by phasing out the production and consumption of ozone depleting substances (ODS), such as chlorofluorocarbons (CFCs), halons and carbon tetrachloride. The Protocol built on 1985 Vienna Convention for the Protection of the Ozone Layer and put in place binding commitments for states to gradually and ultimately eliminate ODS. Its effectiveness lies in the flexible nature of the adjustments and amendments based on scientific and technological advances. This ensures that the treaty remains relevant and effective.[44]

3.2.3 **Sustainable Development Goals (SDhGs, 2015)**

The Sustainable Development Goal (SDG 7 (Clean Energy)[45] focuses on access to affordable and reliable clean energy for all. It recognises that clean energy is a prerequisite for sustainable economic growth, poverty

[40] James Henderson, The Oxford Institute for Energy Studies, Ten Key Conclusions from COP28: a Farewell to Fossil Fuels? January, 2004, Pg. 5. Available at <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2024/01/Insight-143-Ten-key-conclusions-from-COP28.pdf> Accessed on 29 August, 2025.

[41] Chi Yonk Lee, The Rio Declaration on Environment and Development: an Assessment, Third World Network, 2012. Available at <https://www.twn.my/title/end/pdf/end12.pdf> Accessed on 29 August, 2025.

[42] Ibid.

[43] Brian Green, Lessons from the Montreal Protocol: Guidance for the Next International Climate Change Agreement, (2009) pg.256. Available at <https://law.lclark.edu/live/files/17328-39-1green> Accessed on 30 August 2025.

[44] Ibid.

[45] Ranjula Bali and Aminu Karimu, Renewable Electricity and Sustainable Development Goals in the EU,World Development (2020), Vol. 125. Available at <https://www.sciencedirect.com/science/article/abs/pii/S0305750X19303419> Accessed on 30 August, 2025.

reduction and environmental protection. Complementing this, SDG 13 (Climate Action) emphasises urgent action to combat climate change and its impact by strengthening resilience, adopting low-carbon pathways, and integrating climate policies into national planning. These two goals are closely intertwined as transition to clean energy remain one of the most effective strategies to mitigate climate change, while climate action creates an enabling environment for scaling renewable energy solutions and achieving sustainable development.[46]

3.3.0 **Regional Frameworks**

3.3.1 **The International Panel on Climate Change (IPCC)**[47]

This is a scientific intergovernmental panel set up by the World Meteorological Organisation and the United Nations Environmental Programme. The IPCC was tasked with the evaluating the risk of climate change caused by human activity.

3.3.2 **The African Climate Policy Centre (ACPC)**

This is the hub of knowledge and policy generation on climate change in Africa. The Centre organised the Third Annual Conference on Climate Change and Development in Africa (CCDA-III) in Addis Ababa in Ethiopia on the 21st to 23rd of October, 2013. The yearly conference is under the auspices of Climate for Development in Africa Programme.[48] The Conference addressed issues on sharing experiences and dissemination of research results and assesses how Africa is coping with impacts of climate change.[49]

3.3.3 **The National Environmental Standards Regulation And Enforcement Agency (NESREA)**

This is the foremost legislation in Nigeria governing climate change which came into existence in 2007. Sec 7 of the NESREA Acts mandates the agency to enforce compliance with the provisions of international agreements, international laws, protocols, conventions and treaties on the environment.[50]

4.0 **The Role of Opec in the Climate Change Matrix**

The enormous challenges posed by climate change and the inextricable need for *cleaner and renewable energy* has dug a big hole of dilemma for OPEC, resulting in observable ambivalence in her inputs and policy thrust on issues relating to climate change in the 21st century. OPEC is no doubt a very important stakeholder in the international climate change/renewable energy discuss. However, drawing from our analysis of the concept of climate change and renewable energy above, there is no doubt that these should be a huge source of economic and political concern for OPEC Member Countries.

Fossil fuels including coal, oil and natural gas, are currently the world's primary energy source. Formed from organic material over the course of millions of years, fossil fuels have fueled OPEC Member Countries' and global economic development over the past century.[51] The snag, however, is that fossil fuels are finite resources and they can also irreparably harm the environment. According to the Environmental Protection

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[46] Ibid.

[47] According to the IPCC, the extent of climate change on individual regions will vary over time and with the ability of different societal and environmental system to mitigate or adapt to change. It further states that "taken as a whole," the IPCC states that the range of published evidence indicates that "the net damage cost of climate change are likely to be significant and to increase over time."

[48] The Theme of the Conference was: Africa on the rise: can climate change spring the continent to transformative development?

[49] See, ClimDev-Africa, available at https://www.myclimate.org/en/information/faq/faq-detail/what-is-the-kyoto-protocol/ accessed on 15 July, 2025.

[50] See, Nigeria Trade Portal, 'What is NESREA?' Available at https://trade.gov.ng/en/custom-pages/about-nesrea Accessed on 15 July 2025.

[51] Rakan Alyamani and Others., 'Evaluating the Driving Factors and Performance of OPEC Member Countries in Transitioning to Renewable Energy Towards Climate Change Mitigation,' Journal of Cleaner Production, (2025). Vol.5 487 Availabe at https://www.sciencedirect.com/science/article/pii/S0959652624040897#:~:text=The%20OPEC%20member%20countries%20are%20also%20adversely,into%20sustainable%20energy%20to%20mitigate%20climate%20change. Accessed on 15 July, 2025.

Agency (EPA), the burning of fossil fuels was responsible for 79 per cent of U.S greenhouse gas emission in 2010.[52] As earlier noted, these gases insulate the planet, and lead to potentially catastrophic changes in the earth's climate- climate change. Although technologies[53] abound in an effort to mitigate or stall the negative impact of the continuous use of fossil fuel for commercial and domestic purposes, these have been hampered by the huge cost of such innovative technology and the existence of more sustainable alternatives, such as, energy efficiency and sustainable energy have diminished the relevance of these commendable efforts.

4.1 **OPEC's Rhetoric on Climate Change**

OPEC as important stakeholders in the climate change and renewable energy matrix has over the years insisted on its commitment to cutting greenhouse gas emission level and diversification of energy resources in line with the various international agreements and conventions on climate change. Countries have been called to "nationally determine" their contributions given their circumstances- an attempt to avoid a top-down agreement mandating emission cuts.[54] It is worthy of note that fragile and poor countries like Ukraine, Democratic Republic of Congo and Niger have shown commendable commitment towards cutting down carbon emission level, despite limited capacity. By comparison, however, Saudi Arabia, United Arab Emirates and Qatar, which have some of the world's highest level of GDP per head, have been backsliding in this regard.[55]These Gulf (Oil producing) countries have made some moves to diversify their economies away from oil, with Saudi Arabia backing a roll-out of solar projects, for example.[56] Qatar hosted UN's 2013 climate summit in her capital Doha. But OPEC countries have often resisted strong action to curb emissions, fearing the impact on oil sales- their main source of income. This situation was not helped by the fact that in the world of climate diplomacy there are no penalties, just reproachful gazes by the international community.[57]

4.2 **Some OPEC Countries and their Level of Compliance[58]**

The following is the summary of the rating[59] of the level of commitment of some prominent OPEC member countries to climate change:

1. Bolivia-0.1% f Global Emissions

It is said that due to the high level of deforestation, Bolivia's per capita Carbon dioxide emissions among the highest in the world today. Deforestation in Bolivia has increased dramatically over the last two decades, reaching a peak of 852,000 hectares of forest loss in 2019 and 2021 it became the second highest ever recorded at 558,000 hectares.[60] With Bolivia's growth in economic wealth and population may, over the decades, may mean substantial increase under the Business-As-Usual (BAU) scenario.[61] This South

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[52] Ibid (n37).

[53] Such technologies include carbon Capture and Storage (CCS) which helps to reduce the greenhouse gas emissions generated by fossil fuels. See www.eesi.org/topics/fossil-fuels/description

[54] See, National Bureau of Economic Research (NBER), 'The Environmental Benefits of OPEC's Collusive Behaviour,' The Digest (2025). Available at https://www.sciencedirect.com/science/article/pii/S0959652624040897#:~:text=The%20OPEC%20member%20countries%20are%20also%20adversely,into%20sustainable%20energy%20to%20mitigate%20climate%20change. Accessed on 15 July, 2025. Where arguments in favour of the intentional efforts of OPEC towards cutting emission has been proffered.

[55] Ibid (n45)

[56] See, Blackridge Research and Consulting, 'Saudi Arabia Announces Multi-Billion Dollar Greenfield Solar Projects,' (2025). Available at https://www.sciencedirect.com/science/article/pii/S0959652624040897#:~:text=The%20OPEC%20member%20countries%20are%20also%20adversely,into%20sustainable%20energy%20to%20mitigate%20climate%20change. Accessed on 15 July, 2025.

[57] Hall of shame: Who hasn't pledged yet to UN climate Pact? https://www.climatechangenews.com/2015/10/02/hall-of-shame-who-hasnt-pledged-yet-to-un-climate-pact/accessed 15 July, 2025.

[58] Ibid.

[59] Ibid.

[60] Lykke Anderson and Luiz Gonzales and Alfonso Malky, 'Bolivia's Net Zero Path: Investment Needs, Challenges, and Opportunities,' Frontiers,(2022), Available at https://www.frontiersin.org/journals/climate/articles/10.3389/fclim.2022.1026344/full Accessed on 22 July, 2025.

[61] Ibid (n51)

American country has for years called for a world climate court and is not toning down its rhetoric's. Bolivia, natural gas exporter, is planning its own summit to critique capitalism's environmental destruction.[62]

2. Iran-1.88% of Global Emissions

Iran as a country is facing environmental challenges which was exacerbated by climate change. Issues arising from rising temperatures, severe water shortages, droughts and floods and other natural disasters are mounting enormous pressures on Iran's ecosystem and agriculture thereby raising concerns on the country's future viability.[63] Iran's dependence on oil export makes it vulnerable in the face of energy diversification. However, Iran is not famed to be hawkish on climate change. Under pressure from the United States, Iran recently signed a nuclear deal with wide range of prospect.[64] At COP29 which took place in Bakku, Azerbaijan on 22nd day November, 2024, Iran, which happens to be the world's eighth largest CO2 emitter came face to face with the reality of its opportunities and challenges, which includes, its reliance on fossil fuel and the impacts of international sanctions, which complicated its global position in the climate funding and carbon reduction commitments matrix.[65]

3. Saudi Arabia- 1.52% f Global Emissions

Saudi Arabia, has recently announced its highly ambitious dream of achieving net zero green-house gas emissions by 2060, as part of its Saudi Green Initiative. This efforts underscore her dedication to addressing climate change. The snag is that there is a significant gap in comprehensive analysis regarding the long-term effects of their policies on climate change and the level of efforts committed to their net-zero objectives. Saudi Arabia which depends on oil for 90% of its export earnings faces an uncertain future in a low-carbon world. It has in recent times been championing its huge potential for solar.[66] The Saudi authorities have also introduced strategic policies to reduce energy consumption, promote energy efficiency and also reduce the volume of waste it generates. The nodal agency for implementation of these laudable energy efficiency policies is the Saudi Energy Efficiency Center (SEEC). Since its inception, the SEEC has implemented various initiatives, which includes: providing industry energy audits, labelling programmes, setting appliance energy efficiency standards, etc.[67]

4. Sudan-0.26 of Global Emissions

Sudan's political struggles, particularly the ongoing war, is inflicting devastating hardships, include untold human sufferings and damage to the country's ecosystems. The instability poses huge threats to biodiversity and ecological stability. These have long term effects on Sudanese society as it creates heightened climate vulnerability, soil degradation and deforestation.[68] The Sub-Saharan country lost many of its oilfields when South Sudan seceded in 2011, but its emissions remain significant. However, this data reflects the cumulative emission level of both countries.[69] Sudan has consistently shown significant signs of vulnerability to climate change.[70] The University of Notre Dame's ND-GAIN Matrix ranking, Sudan was ranked 8th most vulnerable out of 185 countries in the world and 175th in terms of readiness.[71] These figures indicate the towering

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[62] Emission Database for Global Atmospheric Research, 'GHG Emission of all World Countries,' 2024 Report. Available at https://edgar.jrc.ec.europa.eu/report_2024 Accessed on 21 July, 2025.

[63] Umud Shokri, 'COP29 and Iran: Overcoming Sanctions, Fossil Fuels Dependence and Harnessing China's Role in the Clean Energy Transition,' (2024). Available at https://trendsresearch.org/insight/cop29-and-iran-overcoming-sanctions-fossil-fuel-dependence-and-harnessing-chinas-role-in-the-clean-energy-transition/ Accessed on 22 July, 2025.

[64] Ibid (n51).

[65] Puneet kamboj and others, 'The Path to 2060: Saudi Arabia's Long-Term Pathway for GHg Emission Reduction,' (2024) Vol. 55. Available at https://www.sciencedirect.com/science/article/pii/S2211467X24002463 Accessed on 22 July, 2025.

[66] Puneet (n56).

[67] Ibid.

[68] Abdalftah Hamed, 'Sudan's Puzzle: Confronting Climate Change in a War-torn State,' (2024). Available at https://mecouncil.org/publication/sudans-puzzle-confronting-climate-change-in-a-war-torn-state/ Accessed on 22 July, 2025.

[69] Ibid.

[70] Abdlftah (n59)

[71] Sudan's ND-GAIN Ranking, 2023, Available at< https://gain-new.crc.nd.edu/country/sudan> Accessed on 22 July, 2025.

challenges to Sudan's stability in terms of food security and SDG. Sudan's efforts at tackling climate change, including the construction of the Grand Ethiopean Renaissance Dam (GERD), though filled with prospects, represents existential challenges with geopolitical complexities. This was partly as a result of lack of effective data exchange and coordination with Ethiopia. GERD has heightened fears with regards to safety of Sudan's dam.[72]

5. **Pakistan-0.01% of Global Emissions**

Pakistan is planning to set up carbon markets after suffering brutal wrath of global warming in a heat wave that killed around 2,000 people.[73] As one of the world's most vulnerable countries to climate change, Pakistan is currently on the throes of crippling energy and economic crisis.[74] The country, which happens to be the 5th most populous in the world and home to more than 230 million people, was listed as the 18th largest emitter of greenhouse gases in the world in the year 2018. Its crisis was partly as a result of its dependency on fossil-fuel imports worsened by global price hikes owing to the Russia/Ukraine crisis.[75] Pakistan, in the year 2020 committed to an action plan on building coal-fired power plants and also went further to promise the quadruple power plant fueled with domestic coal in order to meet energy needs and cut fuel importation by 2023. The country has also set for itself "cumulative conditional target" of limiting emissions to 50% of what it expects its business-as-usual levels to be in 2030. Pakistan says that 15% of such will be met by its own resources while 35% will be subject to international financial support.[76]

6. Nigeria-0.73% of Global Emissions

The past Nigerian leadership (including that headed by former President Mohammadu Buhari) promised to make addressing global warming a priority before coming to power, however none of their policy plans on this materialised. Nigeria is Africa's top oil producer and one of the world's top five producers of liquefied natural gas.[77] It has the largest economy and population of any African country and it is expected to overtake both China and India by the end of the century. This West-African country is the world's 25th biggest emitter of greenhouse gases in as at 2019 and it ranked second highest in Africa just a shade off South Africa, which is the highest emitter on the continent.[78] Nigeria has made its commitment to net-zero emission by 2026 known during the COP26 Climate Summit which held in 2021. It also pledged to reduce greenhouse gas emission by 20% by 2030 when compared to its "business-as-usual (BAU)" levels. It further reiterated its commitment to increasing this pledge to 47% on the condition of presence of international support.[79]

7. Egypt-0.63% of Global Emissions

Egypt is famed as a cradle of civilisation, however, Egypt has not been forthcoming with its commitments on carbon cuts. Being a vital player in international energy markets, due to the Suez Canal transit route which strategically links global commerce and impact economies, Egypt remains a strategic player not only in the global energy space but also substantial geopolitics.[80] Egypt, which is located in the arid region, suffer from environmental stresses, including irregularity in precipitation, extreme temperatures, elevated sea levels and land subsidence, shoreline erosion, persistent drought, etc. The cumulation of these challenges create a situation where climate change exert more pressure on the preexisting vulnerabilities. Climate change escalates the burden on government and creates urgency for proactive measures to curtail it. Egypt, which produces 3.5 tons of carbon

[72] Abdlftah (n59)
[73] Ibid (n59)
[74] Daisy Dunne and others, 'The Carbon Brief Profile: Pakistan,' (25 May, 2023). Available at https://interactive.carbonbrief.org/the-carbon-brief-profile-pakistan/index.html Accessed on 22 July, 2025.
[75] Ibid.
[76] Daisy (n65)
[77] Lykke (n51).
[78] 'The Carbon Brief: Nigeria,' (2023). Available at https://www.carbonbrief.org/the-carbon-brief-profile-nigeria/ Accessed on 22 July, 2025.
[79] Ibid (n69)
[80] Amr. Hamzany and Mohamad Al-Mailam and Joy Arkeh,'Climate Change in Egypt: Opportunities and Obstacles,' (2023). Available at https://carnegieendowment.org/research/2023/10/climate-change-in-egypt-opportunities-and-obstacles?lang=en Accessed on 22 July, 2025.

dioxide (CO_2) per person, emits below the global average and pollutes at less than half of European Union (EU) levels. However, although the country accounts for 0.73 percent of global GHGs, its emissions have nevertheless skyrocketed by 74 percent in less about three decades. Egypt will have to reverse this trend if it wishes to achieve energy security and build a greener economy.[81]

5.0 **Conclusion**

In this article, we have examined the complex dynamics between OPEC, climate change and renewable energy law, highlighting the critical role OPEC plays in shaping the global energy landscape. The analysis revealed that while OPEC member countries are crucial stakeholders in the climate change discussion at both the global, regional, sub-regional and domestic levels, their significant reliance on fossil fuels pose major challenges to the global effort to mitigate climate change. Despite the existence of various international legal frameworks aimed at addressing climate change, the lack of robust enforcement mechanisms and the ambivalence of some OPEC member countries towards transitioning to cleaner energy sources remain major hurdles. This article underscores the urgent need for OPEC to adopt a more proactive and collaborative approach in addressing climate change, leveraging its influence to drive the global energy transition towards a more sustainable future. By doing so, OPEC will not only contribute to mitigating the impacts of climate change but also ensure the long-term viability of its member countries' economies in a low-carbon world.

5.1 **Recommendations and Suggestions**

It has been noted that as the world grapples with the challenges of climate change, energy security and economic stability, the Organisation of Petroleum Exporting Countries (OPEC) plays a crucial role in shaping the global energy landscape. Having done a comprehensive anlysis of OPEC's history and its impact on the global energy market and the international, regional and domestic legal frameworks, it is ocular that while a substantial body of law exists to regulate the issues under discussion, enforcement and harmonisation remain weak points in the matrix. Instruments such as the Universal Declaration of Human Rights 1948, the International Covenant on Civil and Political Rights 1966, and regional treaties like the African Charter on Human and People's Rights 1981 collectively establish normative standards. Similarly, domestic statutes across the jurisdictions reviewed - ranging from constitutional guarantees to sector-specific legislations - provide regulatory bases. However, the contemporary challenges lies in the pervasive gap between normative commitments and practical implementation.

In view of the above analysis and findings, this work makes the following recommendations:

1. Member States should should move beyond ratification of treaties and enact enabling legislation to give direct effect to international obligations. In this regard, the provisions of the ICCPR and the African Charter should not remain mere aspirational force but be domesticated into enforceable national laws.
2. Courts in various jurisdictions must adopt a purposive interpretative approach that aligns domestic law with international human rights norms. This judicial posture will bridge gaps where legislative provisions are either silent or outdated.
3. Regulatory institutions tasked with oversight must be adequately resourced to ensure compliance. For where institutional strength is lacking, the best and well intended legal frameworks risk being ineffectual.
4. There is need for regional harmonisation. In Africa, for instance, harmonising domestic laws with the African Union legal instruments would enable coherence, reduce fragmentation and enhance regional enforcement.
5. Civil society, the academia, the media and other relevant stakeholders should be mobilised to create awareness of rights and responsibilities under international and domestic frameworks. This is because legal frameworks, without societal ownership, cannot achieve their full effect.

In conclusion, while the existence of multiple international and domestic legal instruments is commendable, their efficacy depends on the seriousness with which States internalise, implement and enforce these norms. The article therefore submits that meaningful progress will only be realised where legal commitments are oiled with political will, institutional integrity and active judiciary.

[81] Ibid.