

Achieving Net Zero Emissions- A Reflection

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Kariuki Muigua

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Achieving Net Zero Emissions- A Reflection

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Abstract

Achieving net zero emissions has been advocated as a key strategy with the potential to accelerate the global climate agenda. It has been pointed out that the world needs to embrace net zero transition in order to accelerate climate action. This paper critically discusses the need to achieve net zero emissions. It argues that achieving net zero emissions is vital in confronting climate change and fostering Sustainable Development. The paper defines the idea of net zero emissions. It also examines the progress made towards achieving net zero emissions at the global, continental and national levels. The paper further discusses some of the challenges facing the attainment of net zero emissions. It also proposes measures towards achieving net zero emissions.

1.0 Introduction

Climate change has been described as the most defining challenge of our time¹. It has been identified as one of the main global challenges that is affecting both developed and developing countries in their efforts towards realization of the Sustainable Development agenda². Climate change is an undesirable phenomenon that affects realization of the Sustainable Development agenda across the world by affecting the sustainability of the planet's ecosystems, the stability of the global economy and the future of humankind³. The consequences of climate change such as intense droughts, water scarcity, severe fires,

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Arbitration (PCA) [February, 2024].

¹ United Nations Department of Economic and Social Affairs, 'Forum on Climate Change and Science and Technology Innovation.' Available at <https://www.un.org/en/desa/forum-climate-change-and-science-and-technology-innovation> (Accessed on 26/02/2024)

² Muigua. K., 'Achieving Sustainable Development, Peace and Environmental Security.' Glenwood Publishers Limited, 2021

³ Climate Change., 'Meaning, Definition, Causes, Examples and Consequences.' Available at <https://youmatter.world/en/definition/climate-change-meaning-definition-causes-and-consequences/> (Accessed on 26/02/2024)

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rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity are being witnessed across the world affecting the realization of Sustainable Development⁴. It has been argued that if left unchecked, climate change will undo a lot of the development progress made over the past years and will also provoke mass migrations that will lead to instability and wars⁵.

As a result of the foregoing concerns, it has been asserted that the climate time-bomb is ticking⁶. In addition, it has been argued that the world needs a greater climate ambition⁷. There is need to massively fast-track climate efforts by every country and every sector and on every timeframe⁸. Sustainable Development Goal 13 calls upon all countries to take urgent actions towards combating climate change and its impacts⁹.

One of the key mechanisms that has been advocated with the potential to accelerate the global climate agenda is achieving net zero emissions¹⁰. It has been argued that achieving net-zero carbon emissions is a goal for the world to mitigate the worst impacts of climate change¹¹. In addition, it has been pointed out that the world needs to embrace net zero transition in order to accelerate climate action¹².

⁴ Ibid

⁵ United Nations., 'Goal 13: Take Urgent Action to Combat Climate Change and its Impacts.' Available at <https://www.un.org/sustainabledevelopment/climate-change/> (Accessed on 26/02/2024)

⁶ United Nations., 'Secretary-General Calls on States to Tackle Climate Change 'Time Bomb' through New Solidarity Pact, Acceleration Agenda, at Launch of Intergovernmental Panel Report' Available at <https://press.un.org/en/2023/sgsm21730.doc.htm> (Accessed on 26/02/2024)

⁷ Ibid

⁸ Ibid

⁹ United Nations General Assembly., 'Transforming Our World: the 2030 Agenda for Sustainable Development.' 21 October 2015, A/RES/70/1., Available at <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> (Accessed on 26/02/2024)

¹⁰ Nordloh. D., 'The Challenges to Achieving Net Zero Carbon Emissions' Available at <https://energybyentech.com/blog/the-challenges-to-achieving-net-zero-carbon-emissions/> (Accessed on 26/02/2024)

¹¹ Ibid

¹² Nwokolo. S et al., 'Introduction: Africa's Net Zero Transition' Available at https://www.researchgate.net/publication/376294551_Introduction_Africa's_Net_Zero_Transition (Accessed on 26/02/2024)

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This paper critically discusses the need to achieve net zero emissions. It argues that achieving net zero emissions is vital in confronting climate change and fostering Sustainable Development. The paper defines the idea of net zero emissions. It also examines the progress made towards achieving net zero emissions at the global, continental and national levels. The paper further discusses some of the challenges facing the attainment of net zero emissions. It also proposes measures towards achieving net zero emissions.

2.0 Conceptualizing Net Zero Emissions

With the world facing an urgent climate crisis, the need for sustainable solutions has never been greater¹³. It has been observed that one of the most ambitious targets that countries and organisations have set is achieving net-zero emissions¹⁴. According to the Intergovernmental Panel on Climate Change (IPCC) net zero emissions are achieved when anthropogenic carbon dioxide emissions are balanced globally by anthropogenic carbon dioxide removals over a specified period¹⁵. Further, it has been pointed out that the term net zero refers to the target of reducing the greenhouse gas emissions that cause global warming to zero by balancing the amount released into the atmosphere with the amount removed and stored by carbon sinks¹⁶. Net zero carbon dioxide emissions can also be referred to as carbon neutrality¹⁷. According to the Organisation for Economic Co-operation and Development (OECD), net-zero carbon dioxide emissions is also sometimes referred to as carbon neutrality and at a global scale, the two terms are

¹³ DGB Group., 'Net Zero: Benefits, Challenges, Strategies, and the Power of Nature-Based Solutions' Available at <https://www.green.earth/blog/net-zero-benefits-challenges-strategies-and-the-power-of-nature-based-solutions> (Accessed on 26/01/2024)

¹⁴ Ibid

¹⁵ Intergovernmental Panel on Climate Change., 'Glossary' Available at https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_AnnexI.pdf (Accessed on 26/02/2024)

¹⁶ Kyriacou. G., & Burke. J., 'Why is Net Zero so Important in the Fight Against Climate Change?' Available at <https://www.lse.ac.uk/granthaminstitute/explainers/why-is-net-zero-so-important-in-the-fight-against-climate-change/> (Accessed on 27/02/2024)

¹⁷ Intergovernmental Panel on Climate Change., 'Glossary' Op Cit

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equivalent¹⁸. However, OECD points out that at regional, national and sub-national level, the term net-zero carbon dioxide emissions is generally applied to emissions and removals under direct responsibility of the reporting entity, whereas the term carbon neutrality generally includes emissions and removals within and beyond direct responsibility of the reporting entity¹⁹. The term net-zero emissions is understood to cover all anthropogenic greenhouse gas emissions covered by the United Nations Framework Convention on Climate Change (UNFCCC)²⁰. These gases include carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons²¹. It has been pointed out that achieving net zero emissions or carbon neutrality requires striking a balance between the amount of emissions put into the atmosphere with the amount taken out²².

Achieving net zero requires removing carbon emissions from the atmosphere equal to the amount produced by human activities through various measures which include carbon capture and storage, afforestation, and the use of renewable energy sources²³. Further, it has been observed that net-zero emissions will be achieved when all emissions released by human activities are counterbalanced by removing carbon from the atmosphere in a process known as carbon removal²⁴. Achieving net zero requires a two-pronged approach²⁵. On the first part, it requires human-caused emissions (such as those from fossil-fueled vehicles and factories) to be reduced as close to zero as possible²⁶.

¹⁸ Organisation for Economic Co-operation and Development, 'Understanding Countries' Net-Zero Emissions Targets' Available at <https://www.oecd-ilibrary.org/docserver/8d25a20c-en.pdf?expires=1708951187&id=id&accname=guest&checksum=440237330830E3DE611AA54BC67A4665> (Accessed on 26/02/2024)

¹⁹ Ibid

²⁰ Ibid

²¹ United States Environmental Protection Agency 'Sources of Greenhouse Gas Emissions' Available at <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions> (Accessed on 26/02/2024)

²² United Nations Climate Change., 'Get Net Zero Right' Available at <https://racetozero.unfccc.int/wp-content/uploads/2021/07/Get-Net-Zero-right-2.pdf> (Accessed on 26/02/2024)

²³ DGB Group., 'Net Zero: Benefits, Challenges, Strategies, and the Power of Nature-Based Solutions' Op Cit

²⁴ Levin. K et al., 'What Does "Net-Zero Emissions" Mean? 8 Common Questions, Answered' Available at <https://www.wri.org/insights/net-zero-ghg-emissions-questions-answered> (Accessed on 26/02/2024)

²⁵ Ibid

²⁶ Ibid

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Secondly, it requires that any remaining emissions be balanced with an equivalent amount of carbon removal, which can happen through natural approaches like restoring forests or through technologies like direct air capture and storage which scrubs carbon directly from the atmosphere²⁷.

It has been argued that the goal of achieving net zero carbon emissions has become a central paradigm in global climate policy, and increasingly drives both analysis and action²⁸. In addition, it has been pointed out that achieving a net zero future remains the only way to stop a rise in global temperatures and presents many opportunities for development, economic diversification, and growth²⁹. Achieving net zero emissions has numerous benefits for both nature and humanity³⁰. It has been correctly pointed out that investing in nature-based solutions, transitioning to sustainable practices and clean energy sources, and reducing carbon emissions can help alleviate the negative effects of climatic emergencies, including higher temperatures and sea levels, more extreme weather events, and limited access to food and water³¹. In addition, it has been argued that reducing our carbon footprint also creates economic opportunities by developing new industries and jobs in various sectors such as energy, transport, and agriculture³². Additionally, adopting nature-based solutions and reducing the reliance on fossil fuels can contribute to better public health outcomes and improved environmental justice³³. It has also been argued that achieving net zero can foster a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive,

²⁷ Ibid

²⁸ Energy for Growth Hub., 'Who Decides Africa's Net Zero Pathways?' Available at https://energyforgrowth.org/wp-content/uploads/2022/10/Who-Decides-Africas-Net-Zero-Pathways_-2.pdf (Accessed on 26/02/2024)

²⁹ Ibid

³⁰ DGB Group., 'Net Zero: Benefits, Challenges, Strategies, and the Power of Nature-Based Solutions' Op Cit

³¹ Ibid

³² Ibid

³³ Ibid

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sustainable growth³⁴. It is therefore necessary to achieve net zero in order to effectively combat climate change and realize a sustainable future³⁵.

3.0 Achieving Net Zero: Promises and Pitfalls

The need to reduce emissions from greenhouse gases is set out under the *United Nations Framework Convention for Climate Change* (UNFCCC)³⁶. The Convention seeks to achieve the *stabilization of greenhouse gas concentrations* in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system (Emphasis added)³⁷. It further urges countries to undertake several measures in order to reduce greenhouse gas emissions such as implementing national and regional measures aimed at mitigating climate change by addressing anthropogenic emissions³⁸; and promoting and cooperating in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases³⁹.

Further, the *Kyoto Protocol*⁴⁰ commits industrialized countries and economies in transition to *limit and reduce* greenhouse gases emissions in accordance with agreed individual targets (Emphasis added). It requires these countries to implement measures and policies geared towards achieving their emission limitation and reduction commitments towards combating climate change⁴¹. These measures include enhancement of energy efficiency⁴²;

³⁴ United Nations Climate Change., 'Race To Zero Campaign' available at <https://unfccc.int/climate-action/race-to-zero-campaign> (Accessed on 27/02/2024)

³⁵ Ibid

³⁶ United Nations Framework Convention for Climate Change., United Nations, 1992., Available at https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveg.pdf (Accessed on 27/02/2024)

³⁷ Ibid, Article 2

³⁸ Ibid, article 4 (1) (b)

³⁹ Ibid, Article 4 (1) (c)

⁴⁰ United Nations Framework Convention on Climate Change., 'Kyoto Protocol to the United Nations Framework Convention on Climate Change.' Available at <https://unfccc.int/resource/docs/convkp/kpeng.pdf> (Accessed on 27/02/2024)

⁴¹ Ibid, article 2

⁴² Ibid

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promotion of sustainable forms of agriculture in light of climate change considerations⁴³; fostering research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies and cooperation between states to enhance the individual and combined effectiveness of their policies and measures adopted towards confronting climate change⁴⁴.

The idea of achieving net zero is enshrined under the *Paris Agreement*⁴⁵. The objective of the Agreement is to strengthen the global response to the threat of climate change, in the context of Sustainable Development and efforts to eradicate poverty through holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels; increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development⁴⁶. The Paris Agreement provides that in order to achieve the long-term temperature goal set out in Article 2, Parties shall aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of the 21st century, on the basis of equity, and in the context of Sustainable Development and efforts to eradicate poverty⁴⁷. It has been argued that in order to achieve the target set out under the Paris Climate agreement to limit global warming to no more than 1.5°C, greenhouse gas emissions need to be cut in

⁴³ Ibid

⁴⁴ Ibid

⁴⁵ United Nations Framework Convention on Climate Change., 'Paris Agreement.' Available at https://unfccc.int/sites/default/files/english_paris_agreement.pdf (Accessed on 27/02/2024)

⁴⁶ Ibid

⁴⁷ Ibid, article 4 (1)

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half by the year 2030, and to reach net-zero, by the year 2050⁴⁸. IPCC further points out that the world needs to reach net zero by around 2050 if it is to meet the Paris Agreement target of limiting global warming to 1.5°C⁴⁹.

Achieving net zero is envisaged under the *Glasgow Climate Pact*⁵⁰ which was adopted at COP 26. Under the Pact, Parties recognize that limiting global warming to 1.5 °C requires rapid, deep and sustained reductions in global greenhouse gas emissions, including reducing global carbon dioxide emissions by 45 per cent by 2030 relative to the 2010 level and to *net zero* around midcentury as well as deep reductions in other greenhouse gases⁵¹. The Pact also requires Parties to implement and communicate long term low greenhouse gas emission development strategies referred to in Article 4, paragraph 19, of the Paris Agreement towards just transitions to net zero emissions by or around midcentury, taking into account different national circumstances⁵². Actualizing the aspirations of the Glasgow Climate Pact is vital in achieving net zero emissions.

At a regional level, the *East African Community (EAC) Climate Change Policy*⁵³ recognizes the adverse impacts of climate change as a major challenge to socio-economic development globally. The Policy's overall climate change mitigation objective is to promote Sustainable Development in the region while contributing to the global efforts of reducing emissions of greenhouse gases through the Clean Development Mechanisms, Nationally Appropriate Mitigation Actions, Reducing Emissions from Deforestation and

⁴⁸ Renne. D., 'Progress, Opportunities and Challenges of Achieving Net-Zero Emissions and 100% Renewables' *Solar Compass*, Volume 1, 2022

⁴⁹ The Intergovernmental Panel on Climate Change., 'Special Report: Global Warming of 1.5 °C' Available at <https://www.ipcc.ch/sr15/> (Accessed on 27/02/2024)

⁵⁰ United Nations., 'United Nations Framework Convention on Climate Change: Report of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement on its third session, held in Glasgow from 31 October to 13 November 2021' FCCC/PA/CMA/2021/10/Add.1, Available at https://unfccc.int/sites/default/files/resource/cma2021_10_add1_adv.pdf (Accessed on 27/02/2024)

⁵¹ Ibid

⁵² Ibid

⁵³ East African Community., 'East African Community Climate Change Policy.' Available at <https://www.eac.int/environment/climate-change/eac-climate-change-policy-framework> (Accessed on 27/02/2024)

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Forest Degradation or through any other future agreements⁵⁴. The Policy notes that although the EAC region has negligible contribution to global greenhouse gases emissions, it is still important for the region to contribute to the reduction of greenhouse gases through the preparation of Nationally Appropriate Mitigation Actions (NAMAs) for sectors with potentially high emission factors and take other relevant measures⁵⁵. These include sectors such as energy, transport, agriculture, waste management and industry⁵⁶. Implementing this Policy can accelerate the race towards net zero emissions within the EAC.

At a national level, the *Climate Change Act*⁵⁷ of Kenya seeks to enhance the national response to climate change and achieve low carbon climate development for Sustainable Development. The Act sets out several ways of achieving this goal which include reducing emissions intensity by facilitating approaches and uptake of technologies that support low carbon, and climate resilient development⁵⁸. The Climate Change Act has since been amended by the *Climate Change (Amendment) Act*⁵⁹ of 2023 in order to enhance climate change mitigation and adaptation measures in Kenya through the concept of carbon markets. It has been argued that carbon markets can play a vital role in achieving net zero⁶⁰. For example, by purchasing permits or credits generated from emissions-reduction projects, emitting companies can unlock funding for the net-zero transition⁶¹. It is therefore necessary to actualize carbon markets in Kenya as envisaged under the Climate Change (Amendment) Act in order to accelerate the journey towards net zero emissions.

⁵⁴ Ibid

⁵⁵ Ibid

⁵⁶ Ibid

⁵⁷ Climate Change Act., No. 11 of 2016, Government Printer, Nairobi

⁵⁸ Ibid, S (3) (2)

⁵⁹ Climate Change (Amendment) Act, 2023, Government Printer, Nairobi

⁶⁰ United Nations Development Programme., 'Africa Holds the Key to Many Global Climate Solutions' Available at <https://climatepromise.undp.org/news-and-stories/africa-holds-key-many-global-climate-solutions> (Accessed on 27/02/2024)

⁶¹ Ibid

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The need to achieve net zero is therefore well captured at the global, regional, and national levels. There has been some progress towards embracing the idea of net zero and implementing measures towards net zero transition. It has been observed that governments are increasingly accepting that net zero targets need to be included in their Nationally Determined Contributions (NDCs), and a growing number are legislating for net zero⁶². For example, China which is one of the biggest emitters of greenhouse gases has committed to achieving 'climate neutrality' by 2060 – a crucial pledge for enabling the world as a whole to limit temperature rise to 1.5 or 2°C⁶³. In addition, the European Union set out its bloc-wide net zero target for 2050 in its European Green Deal⁶⁴. Under the Deal, the European Union seeks to be the first climate-neutral continent in the world⁶⁵. Further, the United States of America (USA) has also committed to net zero emissions by 2050 at the latest⁶⁶. It has been pointed out that many countries with net zero targets are beginning to incorporate them directly into their NDCs, particularly now that the Glasgow Climate Pact “notes the importance of aligning nationally determined contributions with long-term low greenhouse gas emission development strategies⁶⁷.”

It has been pointed out that there are several opportunities that can be unlocked in order to achieve net zero emissions⁶⁸. These include accelerating the energy transition and embracing renewable sources of energy⁶⁹; investing in nature based solutions⁷⁰; and embracing the use of sustainable materials and reducing waste⁷¹. However, despite the

⁶² Kyriacou. G., & Burke. J., 'Why is Net Zero so Important in the Fight Against Climate Change?' Op Cit

⁶³ Ibid

⁶⁴ European Commission., 'The European Green Deal' Available at https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en (Accessed on 27/02/2024)

⁶⁵ Ibid

⁶⁶ Kyriacou. G., & Burke. J., 'Why is Net Zero so Important in the Fight Against Climate Change?' Op Cit

⁶⁷ Levin. K et al., 'What Does "Net-Zero Emissions" Mean? 8 Common Questions, Answered' Op Cit

⁶⁸ Ibid

⁶⁹ Renne. D., 'Progress, Opportunities and Challenges of Achieving Net-Zero Emissions and 100% Renewables' Op Cit

⁷⁰ DGB Group., 'Net Zero: Benefits, Challenges, Strategies, and the Power of Nature-Based Solutions' Op Cit

⁷¹ Ibid

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importance and opportunities available for achieving net zero, several challenges are hindering the transition towards net zero emissions. It has been argued that the primary challenge of achieving a zero-carbon future is the cost involved⁷². Achieving net zero requires transformation in key sectors including energy, agriculture, and transport which entails significant costs that may overburden or be out of reach for developing countries⁷³. In addition, it has been argued that from a political perspective, achieving net-zero carbon emissions requires strong policies and regulations that incentivize the transition to clean energy sources⁷⁴. As a result, governments must set clear targets and provide financial support to drive investment in clean energy technologies⁷⁵. However, it has been correctly pointed out that political will is often constrained by competing interests such as economic growth, staid policy influence and social welfare⁷⁶. Further, organisations face several barriers in achieving net zero emissions such as creating realistic carbon targets, making carbon reduction a reality, supporting and streamlining supply chains, and choosing the right offsetting method⁷⁷. OECD, further points out that there is a growing gap between the various net-zero commitments put forward and concrete actions being implemented in the near-term⁷⁸. It is therefore necessary to implement net zero commitments and address the underlying challenges in order to effectively confront the problem of climate change.

4.0 Way Forward

In order to achieve net zero emissions, it is necessary to accelerate the energy transition by embracing clean and green sources of energy such as renewable energy⁷⁹. The energy

⁷² Levin. K et al., 'What Does "Net-Zero Emissions" Mean? 8 Common Questions, Answered' Op Cit

⁷³ Ibid

⁷⁴ Nordloh. D., 'The Challenges to Achieving Net Zero Carbon Emissions' Op Cit

⁷⁵ Ibid

⁷⁶ Ibid

⁷⁷ Ibid

⁷⁸ Organisation for Economic Co-operation and Development., 'Understanding Countries' Net-Zero Emissions Targets' Op Cit

⁷⁹ Renne. D., 'Progress, Opportunities and Challenges of Achieving Net-Zero Emissions and 100% Renewables' Op Cit

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sector has been identified as a major contributor to climate change⁸⁰. For example, the extraction and burning of fossil fuels which are the major source of global energy supply has serious environmental consequences including climate change⁸¹. It has been pointed out that when fossil fuels are burned, the stored carbon and other greenhouse gases are released into the atmosphere⁸². An excess buildup of greenhouse gases in the atmosphere as a result of burning of fossil fuels has resulted in dramatic changes to Earth's climate – a trend that will worsen as more fossil fuels are burned⁸³. It has been observed that fossil fuels including coal, oil and natural gas are by far the largest contributor to global climate change, accounting for over 75 per cent of global greenhouse gas emissions and nearly 90 per cent of all carbon dioxide emissions⁸⁴. According to the International Energy Agency (IEA), as the major source of global emissions, the energy sector holds the key to responding to climate change⁸⁵. Achieving net zero therefore demands transitioning from fossil fuels to clean sources of energy such as renewable energy. IEA points out that achieving net zero emissions by 2050 will require nothing short of the complete transformation of the global energy system towards renewable sources of energy⁸⁶. These sources of energy which include wind and solar are vital in achieving net zero since they emit little to no greenhouse gases⁸⁷. Further, these sources of energy are readily available and in most cases cheaper than coal, oil or gas⁸⁸. For example, it has been pointed out that Africa has an abundance of renewable energy (including wind, solar, hydro, bioenergy,

⁸⁰ Muigua. K., 'Transitioning from Fossil Fuels to Clean Energy' Available at <https://kmco.co.ke/wp-content/uploads/2023/12/Transitioning-from-Fossil-Fuels-to-Clean-Energy.pdf> (Accessed on 27/02/2024)

⁸¹ Yildiz. I., 'Fossil Fuels.' *Comprehensive Energy Systems.*, (2018), Volume 1., pp 521-567

⁸² Environmental and Energy Study Institute., 'Fossil Fuels.' Available at <https://www.eesi.org/topics/fossil-fuels/description> (Accessed on 27/02/2024)

⁸³ Ibid

⁸⁴ United Nations., 'Causes and Effects of Climate Change.' Available at <https://www.un.org/en/climatechange/science/causes-effects-climate-change> (Accessed on 27/02/2024)

⁸⁵ International Energy Agency., 'Net Zero by 2050' Available at <https://www.iea.org/reports/net-zero-by-2050> (Accessed on 27/02/2024)

⁸⁶ Ibid

⁸⁷ United Nations., 'Renewable Energy - Powering a Safer Future' Available at <https://www.un.org/en/climatechange/raising-ambition/renewable-energy> (Accessed on 27/02/2024)

⁸⁸ Ibid

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ocean tidal waves, geothermal and other renewables) which can be vital in confronting climate change if well harnessed⁸⁹. According to the African Union, the availability of abundant renewable energy resources on the continent such as hydropower, solar, wind, geothermal and bio-energy can transform Africa's energy sector to modern and sustainable energy through both grid and off-grid systems and contribute to the fight against climate change⁹⁰. It is therefore necessary for Africa and the rest of the world to embrace renewable sources of energy in order to achieve net zero emissions.

Further, it is important to embrace nature based solutions towards climate change⁹¹. Nature-based Solutions have been defined as actions to protect, sustainably manage and restore natural or modified ecosystems, which address societal challenges such as climate change, food and water security and natural disasters effectively and adaptively, while simultaneously providing human well-being and biodiversity benefits⁹². They adopt the use of ecosystems and their services towards addressing societal challenges such as climate change⁹³. It has been asserted that nature based solutions have significant yet underutilized potential to address global threats including climate change, loss of biodiversity, food and water security, human health and natural disasters⁹⁴. It has further been argued that nature based solutions are key to many countries' and companies' plans to achieve net-zero in the coming decades⁹⁵. For example, nature based solutions play a crucial role in achieving net-zero emissions by sequestering carbon and mitigating the

⁸⁹ Africa Union., 'Agenda 2063: The Africa we Want.' Available at https://au.int/sites/default/files/documents/33126-doc-framework_document_book.pdf (Accessed on 27/02/2024)

⁹⁰ African Union., 'Is Energy Transition the Answer to Africa's Climate Change and Socio-Economic Development? What will it Take for Africa to Reach Net-Zero Emissions?' Available at <https://au.int/en/pressreleases/20211109/energy-transition-answer-africas-climate-change-and-socio-economic> (Accessed on 27/02/2024)

⁹¹ Carbon Brief., 'Can 'Nature-Based Solutions' Help Address Climate Change?' Available at <https://www.carbonbrief.org/qa-can-nature-based-solutions-help-address-climate-change/> (Accessed on 27/02/2024)

⁹² International Union for Conservation of Nature, 'Nature-Based Solutions' available at <https://www.iucn.org/our-work/nature-based-solutions> (Accessed on 27/02/2024)

⁹³ Ibid

⁹⁴ Ibid

⁹⁵ Ibid

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effects of climate change⁹⁶. One key nature based solution that is vital in achieving net zero is regrowing natural forests, which can help to sequester and store carbon dioxide in their biomass⁹⁷. It has been observed that this approach involves restoring degraded or deforested areas with native species, increasing biodiversity, improving soil health, and enhancing the community's resilience to climate change⁹⁸. Further, embracing other nature based solutions such as the sustainable management of ecosystems, improving soil health, and using agroforestry practices, can help to sequester carbon, protect biodiversity, and improve the resilience of communities in the face of climate change⁹⁹. Further, it has been pointed out that projects that embrace nature based solutions help to generate carbon credits that provide an income stream for local communities, incentivise environmental protection, provide an opportunity for investors, and help organisations and governments reach net zero¹⁰⁰. It is thus essential to embrace nature based solutions in order to achieve net zero emissions¹⁰¹.

Achieving net zero emissions also requires implementing and fostering effective utilization of carbon markets¹⁰². It has been observed that by purchasing permits or credits generated from emissions-reduction projects, emitting companies can unlock funding for the net-zero transition through carbon markets¹⁰³. According to OECD, international carbon markets could potentially help countries enhance the ambition of their climate commitments and achieve their net-zero targets with greater economic efficiency, complementing domestic emission reduction efforts while providing other

⁹⁶ DGB Group., 'Net Zero: Benefits, Challenges, Strategies, and the Power of Nature-Based Solutions' Op Cit

⁹⁷ Ibid

⁹⁸ Ibid

⁹⁹ Ibid

¹⁰⁰ Ibid

¹⁰² United Nations Development Programme., 'Africa Holds the Key to Many Global Climate Solutions' Op Cit

¹⁰³ Ibid

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sustainable development co-benefits¹⁰⁴. In particular, international carbon markets could be useful for countries that are not able to achieve net-zero emissions through domestic mitigation actions alone¹⁰⁵. Carbon markets are increasingly being seen as an essential part of efforts to reach net zero emissions by around 2050¹⁰⁶. It is therefore necessary to effectively utilize carbon markets in order to achieve net zero emissions.

It is also imperative for all countries to promote low carbon development strategies across all sectors¹⁰⁷. The concept of low carbon development which is also expressed using the term Low-Emission Development Strategies (LEDS) also known as low-carbon development strategies, or low-carbon growth plans refers to forward-looking national economic development plans or strategies that encompass low-emission and/or climate-resilient economic growth¹⁰⁸. Low carbon development has also been defined as forward-looking, climate-friendly growth strategies that can highlight a country's priority actions for climate mitigation and adaptation, and a country's role in the global effort against climate change¹⁰⁹. The idea of low-carbon development aims to achieve the goals of reducing greenhouse gas emissions, exploiting low-carbon energy, and ensuring economic growth¹¹⁰. Low carbon development strategies can help achieve net zero by reducing greenhouse gas emissions¹¹¹. It has been pointed out that reducing emissions at

¹⁰⁴ Organisation for Economic Co-operation and Development, 'Understanding Countries' Net-Zero Emissions Targets' Op Cit

¹⁰⁵ Ibid

¹⁰⁶ Murray. S., 'Can Carbon Markets Accelerate Progress Towards Net Zero?' Available at <https://www.ft.com/content/5349cb46-4c33-4a2e-840a-b8fc94de7254> (Accessed on 27/02/2024)

¹⁰⁷ Muigua. K., 'Enhancing Low Carbon Development for Sustainability' Available at <https://kmco.co.ke/wp-content/uploads/2023/09/Enhancing-Low-Carbon-Development-for-Sustainability-.pdf> (Accessed on 27/02/2024)

¹⁰⁸ United Nations., 'Low Carbon Development.' Available at <https://sustainabledevelopment.un.org/index.php?menu=1448#:~:text=The%20concept%20of%20low%20carbon,low%2Dcarbon%20growth%20plans> (Accessed on 27/02/2024)

¹⁰⁹ United Nations Economic and Social Commission for Asia and the Pacific., 'Low-Carbon Development Plan.' Available at <https://www.unescap.org/sites/default/files/45.%20FS-Low-Carbon-DevelopmentPlan.pdf> (Accessed on 27/02/2024)

¹¹⁰ Yuan. H, Zhou. P, & Zhou. D., 'What is Low-Carbon Development? A Conceptual Analysis.' *Energy Procedia*, 5 (2011) 1706-1712

¹¹¹ International Organization for Standardization., 'Embracing Net Zero: A Crucial Step Towards a Sustainable Future' Available at <https://www.iso.org/climate-change/embracing-net->

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the source is the most effective way to achieve net zero¹¹². It is therefore necessary for countries to embrace low carbon development strategies such as embracing renewable sources of energy including solar, wind and hydropower, adopting climate smart agricultural techniques, fostering sustainable cities, transport and infrastructure and adoption of sustainable waste management techniques in order to achieve net zero¹¹³.

Further, in order to achieve net zero, it is crucial to invest in carbon removal technologies¹¹⁴. It has been suggested that the deployment of greenhouse gas removal technologies can help to achieve net zero across an economy¹¹⁵. For example, technologies like Direct Air Capture and Storage (DACs) can help achieve net zero by scrubbing carbon directly from the atmosphere¹¹⁶. However, it has also been noted that the technologies in question, which include DACs and Bioenergy with Carbon Capture and Storage (BECCS), are not yet proven at scale, can be expensive and energy-intensive, and have their own unwanted negative impacts¹¹⁷. It is therefore necessary to embrace technology with caution and give priority to abating domestic emissions as the primary way to bring emissions to net zero¹¹⁸.

Finally, it has correctly been pointed out that in addition to governments, other entities including organisations, cities, and regions have a role to play in achieving net zero¹¹⁹. It has been argued that businesses and organizations are vital in achieving net zero since the private sector development is the anchor that facilitates the knowledge, skills and

[zero#:~:text=Emission%20reductions%3A%20Reducing%20emissions%20at,innovating%20processes%20to%20reduce%20waste.](#) (Accessed on 27/02/2024)

¹¹² Ibid

¹¹³ Muigua. K., 'Actualizing Africa's Green Dream.' Available at <http://kmco.co.ke/wpcontent/uploads/2023/07/Actualizing-Africas-Green-Dream.pdf> (Accessed on 27/02/2024)

¹¹⁴ Levin. K et al., 'What Does "Net-Zero Emissions" Mean? 8 Common Questions, Answered' Op Cit

¹¹⁵ Kyriacou. G., & Burke. J., 'Why is Net Zero so Important in the Fight Against Climate Change?' Op Cit

¹¹⁶ Ibid

¹¹⁷ Levin. K et al., 'What Does "Net-Zero Emissions" Mean? 8 Common Questions, Answered' Op Cit

¹¹⁸ Ibid

¹¹⁹ Ibid

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infrastructure needed for sustainable practices within developing economies¹²⁰. It has been correctly observed that many companies rely heavily on fossil fuels for their energy needs, and the transition to clean energy may require significant changes to their supply chains and business models¹²¹. However, there are also significant opportunities for businesses that embrace the transition to net zero such as new markets, reduced regulatory risks and more reliable energy¹²². It is therefore necessary for organizations to play their role towards achieving net zero. Further, it has been pointed out that cities have a crucial role to play in achieving net zero since more than half of the global population live in cities, consuming 78% of the world's primary energy and generating more than 70% of global carbon emissions¹²³. It is therefore necessary to catalyze urban decarbonization and resilience by improving energy efficiency, enhancing clean electrification and promoting resource circularity solutions¹²⁴.

The foregoing among other measures are vital in achieving net zero emissions.

5.0 Conclusion

Achieving net zero carbon emissions has become a central paradigm in global climate policy, and increasingly drives both analysis and action¹²⁵. It has been identified as the only way to stop a rise in global temperatures and presents many opportunities for development, economic diversification, and growth¹²⁶. Achieving net zero creates economic opportunities by developing new industries and jobs in various sectors such as

¹²⁰ PwC Kenya, 'Private Sector Development - Catalyst of a Sustainable Africa?' Available at <https://www.pwc.com/ke/en/blog/private-sector-development.html#:~:text=As%20the%20world%20looks%20to,sustainable%20practices%20within%20developing%20economies>. (Accessed on 27/02/2024)

¹²¹ Nordloh. D., 'The Challenges to Achieving Net Zero Carbon Emissions' Op Cit

¹²² Ibid

¹²³ World Economic Forum., 'Net Zero Carbon Cities' Available at <https://www.weforum.org/nzcc/> (Accessed on 27/02/2024)

¹²⁴ Ibid

¹²⁵ Energy for Growth Hub., 'Who Decides Africa's Net Zero Pathways?' Op Cit

¹²⁶ Ibid

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energy, transport, and agriculture¹²⁷. Achieving net zero emissions has numerous benefits for both nature and humanity¹²⁸. There have been commitments and some progress made towards achieving net zero emissions¹²⁹. However, achieving net zero is hindered by challenges such as costs, inadequate political will, and unsustainable business practices¹³⁰. Achieving net zero calls for acceleration of the energy transition by embracing clean and green sources of energy such as renewable energy¹³¹; embracing nature based solutions towards climate change¹³²; implementing and fostering effective utilization of carbon markets¹³³; promoting low carbon development strategies across all sectors including agriculture, energy, infrastructure, transport, and waste management¹³⁴; and investing in carbon removal technologies¹³⁵. Achieving net zero is the way to go in our fight against climate change.

¹²⁷ DGB Group., 'Net Zero: Benefits, Challenges, Strategies, and the Power of Nature-Based Solutions' Op Cit

¹²⁸ Ibid

¹²⁹ Nordloh. D., 'The Challenges to Achieving Net Zero Carbon Emissions' Op Cit

¹³⁰ Ibid

¹³¹ Renne. D., 'Progress, Opportunities and Challenges of Achieving Net-Zero Emissions and 100% Renewables' Op Cit

¹³² Carbon Brief., 'Can 'Nature-Based Solutions' Help Address Climate Change?' Op Cit

¹³³ United Nations Development Programme., 'Africa Holds the Key to Many Global Climate Solutions' Op Cit

¹³⁴ Muigua. K., 'Enhancing Low Carbon Development for Sustainability' Op Cit

¹³⁵ Levin. K et al., 'What Does "Net-Zero Emissions" Mean? 8 Common Questions, Answered' Op Cit

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