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Renewable Energy Policies and Legal Frameworks: A Comparative Analysis of East African Economies

by Prof Geoffrey Aori Mabea[*] and Dr Pontian N. Okoli[**]

Abstract

This article analyses energy transition pathways in East African economies, focusing on the adoption of renewable energy, implementing energy efficiency measures, and deploying emerging technologies such as hydrogen energy and electric mobility. There is a study of the energy mix within the East African Community, considering the dependence on hydropower and given the largely untapped potential of geothermal, wind, and solar resources.

Strategic synergy between relevant laws and policies within individual Partner States as well as regional collaboration are of critical importance. An appropriate regional approach should confront infrastructural deficiencies, regulatory fragmentation and inadequate investment flows within effective policy and legal frameworks. This requires purposive, effective and pragmatic navigation of the Treaty establishing the East African Community.

I. Introduction

Renewable energy ('energy derived from natural resources that are replenished at a higher rate than they are consumed')[1] is essentially sustainable[2] and economically viable.[3] This has prompted numerous countries to realign their policies and regulatory frameworks to incentivise and facilitate the integration of this resource into their energy portfolios.[4] As countries strategise for the energy transition outlined in the Paris Agreement 2015 goals,[5] a central tenet of these efforts remains the mitigation of carbon emissions, particularly in the context of the

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[1] United Nations, 'Climate Action: What is Renewable Energy?' <https://www.un.org/en/climatechange/what-is-renewable-energy> accessed 20 December 2025.

[2] For the argument that 'renewable energy systems can also have potential enabling and inhibiting relationships with a number of other SDGs within the environmental category, including life below water (SDG 14), life on land (SDG 15) and clean water and sanitation (SDG 6)', see J Tian and others, 'Is renewable energy sustainable? Potential relationships between renewable energy production and the Sustainable Development Goals' (2024) 3 (35) *npj Climate Action* 1, 1-2.

[3] International Renewable Energy Agency, '91% of New Renewable Projects Now Cheaper Than Fossil Fuels Alternatives' <https://www.irena.org/News/pressreleases/2025/Jul/91-Percent-of-New-Renewable-Projects-Now-Cheaper-Than-Fossil-Fuels-Alternatives> accessed 20 December 2025.

[4] The London School of Economics and Political Science, 'New study reveals all countries that have signed or ratified the Paris Agreement have at least one national law or policy on climate change' (Press release, 30 April 2018) <https://www.lse.ac.uk/granthaminstitute/news/new-study-reveals-all-countries-that-have-signed-or-ratified-the-paris-agreement-have-at-least-one-national-law-or-policy-on-climate-change/> accessed 17 October 2025. Africa is one of the regions 'undergoing a phase of dynamic growth.' See Joana Setzer and Catherine Higham, 'Global trends in climate change litigation: 2025 snapshot' (Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science) 1, 13 <https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2025/06/Global-Trends-in-Climate-Change-Litigation-2025-Snapshot.pdf> accessed 17 October 2025.

[5] Notably, limiting temperature increase to 1.5°C above pre-industrial levels. See art 2.

circular economy paradigm.[6] Moreover, in integrated energy markets, the strategic allocation of investment in renewable energy infrastructure and the optimal timing of the transition are pivotal considerations in reducing energy risk.[7] A comprehensive understanding of the interplay between the policies of international and national market stakeholders, alongside a nation's efforts to ensure a sustainable, affordable, and resilient energy supply, is critical to achieving widespread acceptance and ensuring the transition's success.[8]

A systematic enquiry into the energy transition's success requires a navigation between renewable energy policies and relevant legal frameworks. The African Union (AU) has at least recognised the need to support AU Member States to 'strengthen management of energy efficiency programmes at national and regional levels, including complete legal framework on energy efficiency'.[9] However, there are no robust or coherent policy and legislative roadmaps which are required as foundations for sustainable development including the East African Community (EAC).[10] Partner States[11] of the EAC are the Democratic Republic of Congo, Burundi, Kenya, Rwanda, Somalia, South Sudan, Uganda and Tanzania.[12] It is not only difficult to separate the study of energy law from energy policy, but both are also interwoven.[13] Together, they sit at the centre of the energy law and policy triangle with 'economics (finance), politics (energy security) and environment (climate change mitigation) … each trying to pull energy law and policy in their direction.'[14] It is crucial to have 'effective and efficient law and policy' if an appropriate balance is to be struck.[15]

Such balance has not been struck in the EAC with respect to clean energy, although the challenge is not uniquely East African despite Africa's vast reserves of key minerals for clean energy.[16] This inadequacy is also compounded by the fact that individual states generally deal with relevant renewable energy and transition issues on individual bases.[17] The indicative capacities for regional collaboration or even the willingness to do so may differ depending on

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[6] Mikulčić Hrvoje and others 'Energy transition and the role of system integration of the energy, water and environmental systems' (2021) 292 Journal of Cleaner Production 1, 2.

[7] Bashir Muhammad Farhan, Ugur Korkut Pata and Luqman Shahzad, 'Linking climate change, energy transition and renewable energy investments to combat energy security risks: Evidence from top energy consuming economies' (2025) 314 Energy 1, 2-5.

[8] Weiss Olga and others, 'The Swiss energy transition: Policies to address the Energy Trilemma' (2021) 148 Energy Policy 1, 3.

[9] African Energy Commission, 'African Energy Efficiency Programme' <https://au-afrec.org/energy-efficiency-programme> accessed 17 October 2025. The African Energy Alliance was also established, both 'towards securing a sustainable and energy-efficient future for the African continent' <https://au.int/en/pressreleases/20241115/african-union-launches-african-energy-efficiency-programme-and-african-energy> accessed 17 October 2025.

[10] The EAC Partner States are subject to the principles and values outlined in the Treaty for Establishment of the East African Community. EAC, 'EAC Partner States' <https://www.eac.int/eac-partner-states> accessed 17 October 2025.

[11] Under the Treaty for the Establishment of the East African Community 1999, 'Partner States' are 'the Republic of Uganda, the Republic of Kenya and the United Republic of Tanzania and any other country granted membership to the Community under Article 3 of this Treaty.' See art 2.

[12] EAC, 'EAC Partner States' <https://www.eac.int/eac-partner-states> accessed 17 October 2025.

[13] Raphael J Heffron, *Energy Law: An Introduction* (Springer 2015) 3.

[14] ibid 4.

[15] ibid 4.

[16] E.g., 'Africa accounts for over 40% of global reserves of cobalt, manganese and platinum – key minerals for batteries and hydrogen technologies.' See International Energy Agency, 'Africa Energy Outlook 2022: Key Findings' <https://www.iea.org/reports/africa-energy-outlook-2022/key-findings> accessed 2 March 2025.

[17] On how individual-State approach adversely affects climate change action, see Pontian Okoli and Etisang Abraham, 'In search of a sustainable future: A comparative assessment of climate change regimes in Nigeria and Kenya' (2022) 33(2) Review of European, Comparative & International Environmental Law 276, 276-277.

national laws. In Kenya, an example of the more positive end of the EAC renewable energy development spectrum, there are relatively few statutory provisions concerning the promotion of regional and international participation regarding energy efficiency.[18] The Kenyan Energy Act of 2019 defines renewable energy as 'non-fossil energy generated from natural non-depleting resources including but not limited to solar energy, wind energy, biomass energy, biological waste energy, hydro energy, geothermal energy and ocean and tidal energy.'[19] The Act enables the promotion of 'local, regional and international participation in research activities, particularly in technology-oriented research.'[20] This is an improvement on earlier statutory provisions concerning renewable energy provisions but without any regional participation strategy.[21] In Somalia, an example of the less positive end of the EAC energy development spectrum, policy makers have been urged to 'consider local contexts, prioritising solutions urgently needed to support the existing transport fleet while encouraging the innovative development of low-carbon alternatives (e.g. electric vehicles and green hydrogen).'[22] Political economy dynamics are generally helpful in contextual framing generally and have 'greatly shaped transition policies routed in neoliberal tenets.'[23] However, this article factors in such dynamics only to the extent that they have been expressed through relevant institutions (e.g., Parliament, economic policies/agenda and the link between energy poverty and deprivation). This is because it can be complex to determine the extent to which political economy factors have been properly considered with respect to energy transition.[24]

Investments in infrastructure and regulatory frameworks are necessary.[25] There is also a need to increase energy efficiency as key to economic development.[26] It is critical to engage with energy efficiency as the 'first fuel' in the sustainable-development transition to clean energy.[27] Despite the generally complementary relationship between energy efficiency and renewables, there may be competing costs which can even lead to trade-offs especially since financial resources are limited in most economies including the EAC.[28] There are however 'policy and regulatory hurdles' not just in the EAC but also in other parts of Africa,[29] aptly described as often 'fragmented, incoherent, and weakly enforced' thus causing uncertainty for investors.[30]

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[18] E.g., Kenya Energy Act 2019 s 56(2)(j) and s 190(0). Cf the Electricity (Amendment) Act 2022.
[19] Energy Act 2019 s 2.
[20] Energy Act 2019 s 56(2)(j).
[21] Electricity Act 1999.
[22] International Renewable Energy Agency, *Energy Transition Assessment: Somalia* p 10 <https://cisp.cachefly.net/assets/articles/attachments/95015_irena_cou_energy_transition_assessment_somalia_2025.pdf> accessed 20 December 2025.
[23] Gerald E Arhin, Emmanuel Kofi Gavu and David A Quansah, 'How Just are transition plans? An analysis of the energy transition and investment plans of Ghana and Kenya' (2026) Climate Policy 1, 9.
[24] ibid
[25] Mohamed Okasah, 'The renewables dividend: Why Somalia must bet big on clean power' World Economic Forum (5 September 2025) <https://www.weforum.org/stories/2025/09/somalia-renewable-energy-dividend/> accessed 20 December 2025.
[26] International Renewable Energy Agency, *Energy Transition Assessment: Somalia* p 9 <https://cisp.cachefly.net/assets/articles/attachments/95015_irena_cou_energy_transition_assessment_somalia_2025.pdf> accessed 20 December 2025.
[27] Kate Whiting, 'Energy efficiency is the world's "first fuel" – and the main route to net zero, says IEA chief' <https://www.weforum.org/stories/2022/01/iea-energy-efficiency-worlds-first-fuel-net-zero/> accessed 17 October 2025.
[28]REN21 Renewables Now, 'Energy Efficiency and Renewables' <https://www.ren21.net/gsr-2020/chapters/chapter_07/chapter_07/> accessed 17 October 2025.
[29] African Energy Commission, 'The African Energy Efficiency Strategy (AfEES) – Africa's Path to a Sustainable Future' <https://au-afrec.org/african-energy-efficiency-strategy-afees> accessed 20 December 2025.
[30] Kudzanayi Chiteka and Christopher Enweremadu, 'Harnessing Africa's renewable potential with an integrated framework for energy justice and climate resilience' (2025) 6: 1220 Discover Sustainability 1, 10.

This article seeks to answer the central question of how the EAC can fast-track a transition to clean energy in an inclusive and just manner. The article focuses on inclusivity, but it is difficult to divorce inclusivity from justice in the East African context. For example, 'East African countries have agreed to move faster in energy transition, but without sacrificing critical industries like oil and gas and minerals.'[31]

Existing literature offers useful insights into different aspects of sustainable energy transition. Some scholars underscored the urgency of expediting the transition to low-carbon energy systems, while advocating for a gradual, phased investment approach to ensure system stability and minimise economic disruption.[32] Others investigated the optimal trajectory and temporal dynamics of transitioning from fossil fuel-based to renewable energy sources, recommending long-term planning horizons to achieve maximised utility.[33] Their analysis utilised an advanced econometric model, encompassing six hundred simulation scenarios, to substantiate the viability of such strategies.[34] In parallel, the examination of renewable energy's impact within an integrated energy system necessitates an in-depth analysis of its spatial and temporal distribution. However, there is no focus on how EAC policy and legal frameworks can address energy transition in an inclusive manner from an EAC-wide standpoint.[35] This article fills the gaps regarding the issues highlighted and in the context of a regional approach in a way that has not been done before.

There is a strong argument that the geographic distribution of renewable generation assets presents significant challenges for transmission network planning and investment decisions.[36]

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[31] Nebert Rugadya, 'Energy Transition: EAC Countries Urged to Cooperate in Resource Exploitation' URN (19 October 2022) <https://ugandaradionetwork.net/story/energy-transition-eac-countries-urged-to-cooperate-in-resource-exploitation?districtId=0> accessed 20 December 2025.

[32] Jean-Pierre Amigues, Alain Ayong Le Kama and Michel Moreaux, 'Equilibrium transitions from non-renewable energy to renewable energy under capacity constraints' (2015) 55 Journal of Economic Dynamics and Control, 89-112; Coulomb Renaud, Oskar Lecuyer and Adrien Vogt-Schilb, 'Optimal Transition from Coal to Gas and Renewable Power Under Capacity Constraints and Adjustment Costs' (2019) 73(2) Environmental and Resource Economics 557-590.

[33] Bonneuil Noël and Raouf Boucekkine, 'Optimal transition to renewable energy with threshold of irreversible pollution' (2016) 248(1) European Journal of Operational Research, 257-262.

[34] ibid.

[35] Legal literature shows the need for systematic and systemic intervention. For the gap between EAC regional policy trajectories or aspirations and national laws or policies, see East African Community, *EAC Energy Security Policy Framework 2018* p 137 <https://archive.uneca.org/sites/default/files/images/eac_energy_report_fa.pdf> accessed 20 December 2025. On how energy law and policy differ significantly in the region, see Aleem Tharani, 'Harmonization in the EAC' in Emmanuel Ugirashebuja and others, *East African Community Law Institutional, Substantive and Comparative EU Aspects* (Brill 2017) 486, 487. On the need to 'develop policy, law and supportive mechanisms to leverage private investments' regarding green energy, see Elizabeth Gachenga, 'Legal and Policy Frameworks for Climate-friendly Energy Generation in Africa: Energy Security for Future Development' in Oliver C. Ruppel & Bernd Althusmann (eds), *Perspectives on Energy Security and Renewable Energies in Sub-Saharan Africa: Practical Opportunities and Regulatory Challenges* (2nd edn, Macmillan Education Namibia, 2015) 131, 148. On the need to improve legal and regulatory frameworks, see James Nyamongo and Lilian K. Nyamongo, 'Energy Infrastructure Investments in East Africa and the Relevance of the Energy Charter Treaty' (Energy Charter Secretariat 2019) 1, 3 <https://www.energycharter.org/fileadmin/DocumentsMedia/Occasional/Energy_Infrastracture_Investment_in_East_Africa.pdf> accessed 20 December 2025. Buzingo argued that 'the lack of a legal and regulatory framework on energy in the region […] needs to be addressed in order to facilitate and improve trade and investment in the Community.' See Sandrine Munezero Buzingo, 'Challenges and Opportunities in Developing a Common Legal and Regulatory Framework on Energy in East African Community' (University of Pretoria Center for Human Rights International Development Law Unit, 2021) p 3.

[36] H Rudnick and LA, 'Facing Uncertainties: The Economics of Transmission Networks' (2016) 14(4) IEEE Power and Energy Magazine 12; V Saxena, 'Navigating the complexities of distributed generation: integration, challenges, and solutions (2024) 12 Energy Reports 3302.

As certain renewable resources are in remote areas,[37] often far from established load centres and existing transmission infrastructure, the alignment of generation and transmission investment is of critical importance. Thus, before any generation capacity investment, it is essential to conduct a detailed economic evaluation to ensure that transmission expansion is both cost-effective and responsive to system needs. This evaluation should ensure that the capital expenditures on transmission infrastructure are outweighed by the expected economic returns from the enhanced connectivity and energy delivery.[38] Furthermore, the decentralised nature of renewable generation necessitates an integrated approach to transmission network design and operation.[39] As such, decisions regarding the timing, nature, and scale of transmission investments should be optimised to minimise system costs while maximising economic benefits, considering both operational and capital cost considerations.[40]

To attain and sustain such investment flows, however, it is critical to develop two key sets of provisions underpinning sustainable energy transition. The first set concerns effective policy and legal frameworks. The second concerns infrastructure, and this set should be anchored to the first to ensure sustainable development underpinned by legal certainty that enables economic and commercial support. Both sets of provisions underpin the central thesis of this article which is the need for a systematic coordination of integrated renewable energy development in the EAC. Such coordination requires effective policies and frameworks, backed up by infrastructure, to streamline key components of effective energy transition. Streamlining all key energy transition components identified for the purposes of this article (security, sustainability and affordability) should be done concurrently.[41] In this way, effective energy transition can be fast tracked in an inclusive manner. In appropriate cases, private sector investment decisions can influence or even drive how new renewable energy generation capacity is located. Genuine public-private partnerships should be pragmatic as, if properly run, they will help to address the traditional bureaucracy that often clogs efficiency while benefitting from State support and network. Such partnerships can also help to de-risk investments across the region.[42]

It is vital to expedite energy transition in the EAC by adopting an inclusive approach for some reasons. First, addressing energy poverty is foundational. For example, sub-Saharan Africa contains by far the greatest number of people without access to electricity.[43] Second, climate change is a major consideration for the EAC in regional developmental strategy. For example, the Summit of the EAC Heads of State agreed that 'increased investment in climate smart agriculture and renewable energy is the best approach to mitigate the impact of climate

[37] For example, the Great Rift Valley contributes to Kenya's position as 'Africa's leading geothermal energy production country.' Also, 'areas near Lake Turkana and the Ngong Hills experience strong and consistent winds, making them suitable for wind power generation. Lake Turkana Wind Power Project, the largest in Africa, significantly boosts Kenya's renewable energy capacity.' See Ibrahim Kipngeno Rotich, Hilda Chepkirui and Peter K Musyimi, 'Renewable energy status and uptake in Kenya' (2024) 54 Energy Strategy Reviews 1, 2.

[38] International Energy Agency (IEA), Electricity Grids and Secure Energy Transitions (IEA 2023) <https://www.iea.org/reports/electricity-grids-and-secure-energy-transitions> accessed 13 October 2025.

[39] Hobbs and others, 'Adaptive Transmission Planning: Implementing a New Paradigm for Managing Economic Risks in Grid Expansion' (2016) 14(4) IEEE Power and Energy Magazine 30-40.

[40] ibid.

[41] Suggestions of 'inside out' and 'outside in' strategies are put forward in Part V of this article.

[42] Nnadozie Ifeanyi-Nwaoha, Energising Africa: Enabling Private Sector Development in Renewable Energy (Africa Policy Research Institute – Policy Brief 009, June 2025). The document may be accessed through <https://afripoli.org/energising-africa-enabling-private-sector-development-in-renewable-energy> accessed 31 March 2026.

[43] About 80% of the world's total. See IEF, 'How can we tackle energy poverty in Africa?' (7 October 2024) <https://www.ief.org/news/how-can-we-tackle-energy-poverty-in-africa> accessed 20 December 2025.

change'.[44] Third, African countries strategically need to position themselves to benefit from the global energy transition value chain especially from the perspective of economic transformation.[45] As a regional trading bloc the EAC seems better positioned to engage in external trade,[46] although the AU presents a significantly wider and potentially stronger platform.[47] In the Nairobi Declaration, the AU set out an economic transformation and decarbonisation agenda to 'increase Africa's renewable generation capacity from 56 Giga Watts (GW) in 2022 to at least 300 GW by 2030, both to address energy poverty and to bolster the global supply of cost-effective clean energy for industry.'[48] Mobilising the necessary capital for development and climate action requires the engagement of the public and private sectors.[49] All these reasons to expedite energy transition will benefit from a systematic and integrated regional approach driven by inclusivity.

The relevance and application of the energy trilemma is set out in Part II just before Part III provides an analytical context regarding the energy mix in the EAC. Using a 'comparative method and comparative policy analysis'[50] and law-in-context method,[51] this article will answer the question earlier stated (how the EAC can fast-track a transition to clean energy in an inclusive manner) by first assessing renewal energy policies and laws in Part IV. EAC countries are compared as Partner States of the regional intergovernmental organisation and governed by the Treaty Establishing the East African Community 1999.[52] The context in question is socio-economic and to illustrate, a major implication of energy poverty is that 'even the word "transition" makes no meaning.'[53] An understanding of such context is, therefore, key in policy and legal analysis regarding energy transition. The article also draws on relevant data from the region in making certain core arguments.[54] The data also support the comparative policy and legal arguments. The energy policies and laws are assessed through the themes of energy efficiency, electric mobility, and green hydrogen energy. In Part V, the article analyses the prospects of a regional approach to policy and legal frameworks including innovative suggestions that can ensure inclusive progress from the perspectives of individual Partner

[44] 'Climate Smart Agriculture and Green Renewable Energy the way to go to mitigate Climate Change and boost Food Security' <https://www.eac.int/press-releases/144-environment-natural-resources/2974-climate-smart-agriculture-and-green-renewable-energy-the-way-to-go-to-mitigate-climate-change-and-boost-food-security> accessed 20 December 2025.

[45] James Boafo, Senyo Dotsey, and Rochelle Spencer, 'Energy transition diplomacy: The EU's pursuit of Africa's critical minerals for renewable energy at whose expense?' (2025) Energy Research and Social Science 1, 8.

[46] E.g., 'In 2023, total global merchandise trade by the EAC grew by 2.37%, valued at more than US$80 billion.' See EAC, 'Collection, Analysis, Compilation and dissemination of trade and investment information' <https://www.eac.int/trade/79-sector/trade> accessed 20 December 2025.

[47] Notably through the AfCFTA but this will take some time be gain full traction.

[48] African Union, *Summary of the African leaders Nairobi Declaration on Climate Change and Call to Action* (The Africa Climate Summit 4th - 6th September 2023 Nairobi, Kenya) p 6 <https://au.int/sites/default/files/documents/43682-doc-AU_Nairobi_Declaration_Action_1.pdf> accessed 31 March 2026.

[49] ibid.

[50] B Guy Peters, 'The comparative method and comparative policy analysis' in B Guy Peters and Guillaume Fontaine (eds), *Handbook of Research Methods and Applications in Comparative Policy Analysis* (Edward Elgar, 2020) 20-18.

[51] Sanne Taekema and Wibren van der Burg, *Contextualising Legal Research* (Edward Elgar, 2024) 93 -116.

[52] EAC, 'Overview of the EAC' <https://www.eac.int/overview-of-eac> accessed 20 December 2025.

[53] As the Ugandan State Minister for Minerals observed since 'in Uganda and most of Africa, more than 80 percent of the population has no electricity.' Energy Transition: EAC countries urged to cooperate in resource exploitation The Kampala Report (20 October 2022) <https://www.thekampalareport.com/money/2022102020406/energy-transition-eac-countries-urged-to-cooperate-in-resource-exploitation.html> accessed 20 December 2025.

[54] Some of these data are drawn from the portfolio committees of the Energy Regulators Association of East Africa. See Energy Regulators Association of East Africa, *Data Hub* <https://energyregulators.org/secretariat-reports/> accessed 6 January 2026.

States and across the EAC region. Part VI then draws conclusions that can thrive within a variable geometry principle context. The next section situates this research within the Energy Trilemma framework.

II. The Energy Trilemma Framework

Essentially, the Energy Trilemma focuses on the need to balance energy security, environmental sustainability, and economic affordability.[55] This fits into the first dimension of the EAC Energy Union: 'energy security, affordability, and efficiency; providing reliable energy at affordable cost and in an efficient manner to spur economic growth in the region.'[56] This part of the article provides an analytical context for the relevance of the Energy Trilemma and how its use adds value to the research. Fundamentally, effective use of the Energy Trilemma should stimulate economic growth in the long term, but energy policy coherence and integration are necessary.[57] Such coherence is critical in the EAC considering the significantly different trajectories of economic development.

Renewable energy is not perfectly environmentally friendly of course,[58] but it is vastly better than fossil fuels.[59] This important distinction has shaped contemporary approaches to promoting green energy and mitigating climate change. From a practical perspective, energy efficiency is an overarching consideration in this article. Energy efficiency, by reducing final energy consumption, 'allows the same level of renewable energy uptake to meet a larger share of energy consumption.'[60] The fact that such efficiency 'also reduces the capital investment required to supply the demand through on-site and/or off-site renewables'[61] is relevant to developing countries considering their increasing energy use.[62] Factoring in energy efficiency as a theme in this article aligns with the awareness and trajectory of the East African region[63] and the AU.[64] Specifically, the EAC is interested in adopting policies and mechanisms that will promote the efficient exploitation of energy resources available within the region.[65] The region

[55] Mohammed Lawal Giwa, Ehizele Dean Okoduwa and Abidemi Aina, 'The energy trilemma: Balancing security, sustainability and affordability in a fragmented world' (2024) 24(3) World Journal of Advanced Research and Reviews 3447, 3447-3448.

[56] Other dimensions are (1) a fully integrated and competitive energy market; (2) just energy transition; and (3) sustainable capacity building and research 'EAC Energy Union' <https://energyregulators.org/eac-energy-union/> accessed 20 December 2025.

[57] Irfan Khan and others, 'World energy trilemma and transformative energy developments as determinants of economic growth amid environmental sustainability' (2022) 108 Energy Economics 1, 14.

[58] SA Abbasi and Naseema Abbasi, 'The likely adverse environmental impacts of renewable energy sources' (2000) 65(1-4) Applied Energy 121.

[59] Laura Huomo and Hilma Huttunen, 'New EU regulation for renewable hydrogen' (2023) 5 International Energy Law Review 135.

[60] 'Energy Efficiency and Renewables' Ren21 Renewables Now <https://www.ren21.net/gsr-2020/chapters/chapter_07/chapter_07/> accessed 20 December 2025.

[61] ibid.

[62] ibid.

[63] E.g., the East Africa Centre for Renewable Energy and Energy Efficiency (EACREEE) <https://www.iea-shc.org/eacreee> accessed 20 December 2025.

[64] African Energy Commission, 'The African Energy Efficiency Strategy (AfEES) – Africa's Path to a Sustainable Future' <https://au-afrec.org/african-energy-efficiency-strategy-afees> accessed 20 December 2025.

[65] EAC, 'Overview of Energy Sector' <https://www.eac.int/energy> accessed 20 December 2025. On the need for a cost-effective energy approach, see EAC Secretariat, 'EAC Partner States reaffirm their commitment to advancing renewable energy sources and addressing fossil fuel challenges in the region' (14 February 2024) <https://www.eac.int/press-releases/143-energy/3016-eac-partner-states-reaffirm-their-commitment-to-advancing-renewable-energy-sources-and-addressing-fossil-fuel-challenges-in-the-region> accessed 20 December 2025.

is interested in providing innovative models for energy efficiency and technologies as a part of its sustainable capacity building.[66]

Trying to achieve energy efficiency and energy competitive abundance can progress concurrently. For example, Kenya 'targets to double improvements in energy efficiency by 2030 in order to achieve SDG 7, which requires access to affordable, reliable, sustainable and modern energy for all.'[67] At the same time, the Kenyan government is directly (e.g., through the Centre for Energy Efficiency and Conservation) and indirectly (e.g., through other initiatives by stakeholders such as promoting e-mobility and efficient design in buildings) supporting energy efficiency.[68] In Uganda, similarly, 'several non-state actors are actively collaborating with the government on a variety of energy efficiency programmes.'[69] This is so despite the fact that Uganda has been 'characterised by a relatively high energy intensity'[70] (which a transition to green energy should help to address).[71]

The potential for reliable energy supply aligns with the benefits of renewable energy considering the potential for energy security. In Kenya for example, the use of green hydrogen has put Kenya 'on track to achieve 100 per cent renewable energy.'[72] Kenya, Rwanda, Tanzania and Uganda (all members of the EAC) are among the pioneers of electric mobility and the most advanced in Africa.[73] It is now clear that not only can electric mobility enhance national energy security,[74] but also a low uptake can adversely affect decarbonisation efforts in the transport industry.[75] It is important to caution against overregulation in any way that could stifle innovation.[76] Appropriate private-public partnership should support the use of the energy trilemma framework to strike a balance between energy security, environmental sustainability and economic affordability. There is fertile ground for this approach to thrive as, for example, the Kenyan presidency 'emphasised that the e-Mobility Policy was developed through strong

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[66] EAC Energy Union, <https://energyregulators.org/eac-energy-union/> accessed 20 December 2025.
[67] Republic of Kenya (Ministry of Energy & Petroleum State Department for Energy), *National Energy Policy 2025 – 2034* p 30 <https://www.energy.go.ke/sites/default/files/Final%20Draft_National%20Energy%20Policy%202025_November%202025.pdf> accessed 31 March 2026.
[68] ibid
[69] International Energy Agency, *Uganda 2023: Energy Policy Review* 129 <https://iea.blob.core.windows.net/assets/e329674b-f51f-4eb0-b0fd-402ddc016d90/Uganda2023.pdf> accessed 31 March 2026.
[70] ibid 130.
[71] Tunahan Degirmenci and others, 'The role of energy intensity, green energy transition, and environmental policy stringency on environmental sustainability in G7 countries' (2025) 27 Clean Technologies and Environmental Policy 2982, 2983-2984.
[72] Benson Senelwa and Rose Ngugi, 'Green Hydrogen in Kenya: The Potential to Unlocking Industrial Growth and Climate Resilience' The Kenyan Institute for Public Policy Research and Analysis (11 June 2025) <https://kippra.or.ke/green-hydrogen-in-kenya-the-potential-to-unlocking-industrial-growth-and-climate-resilience/> accessed 20 December 2025.
[73] Naville Geiriseb and others, 'Towards Electric Mobility in East Africa Current Trends and Policy Approaches' 1, 4 <https://www.agora-verkehrswende.org/fileadmin/Projekte/2025/East_Africa/139_Scaling_eMob-EastA.pdf> accessed 20 December 2025.
[74] Obiora A Nnene, Iremitide I Oyelohunnu and Mark HP Zuidgeest, 'Availability of electric mobility policy and its potential for adoption in Africa' (2026) 151 Transportation Research Part D: Transport and Environment,1, 19.
[75] Obiora A Nnene, Iremitide I. Oyelohunnu and Mark H.P. Zuidgeest ibid 1.
[76] Africa Policy Research Initiative, 'Pioneering the future of E-Mobility with Kiri EV' <https://afripoli.org/pioneering-the-future-of-e-mobility-with-kiri-ev#:~:text=The%20inception%20of%20Kiri%20EV,also%20known%20as%20tuk%2Dtuks.> accessed 31 March 2026.

public-private sector collaboration, with the private sector chairing the Taskforce.'[77] This is so despite the fact that the private sector (notably startups) initially drove the initial stages of e-mobility.[78]

While there may be a practical question regarding traditional drivers of the economic agenda in the region, this article focuses on the trajectory that supports economic growth as this is a core element of renewable energy dynamics. Regarding Kenya, for example, some scholars observed in comparative analysis:

> *From a distributional justice perspective, both ETIPs [Energy Transition and Investment Plans] identify the potential surge in economic growth and job creation in transitioning to green fuels. In Kenya's case, the transition is expected to create additional 500,000 new jobs by 2050 while 400,000 new jobs are estimated to be created in Ghana by 2060. A significant portion of these jobs are expected to directly come from investment in solar PVs and electric vehicles (EV) charging/hydrogen fuelling stations. These are useful highlights on how the plan of both countries can maximize the benefits associated with the transition agenda. However, it is not clear on how these plans fairly distributes the risks*.[79]

The EAC hosts a substantial number of people without access to electricity whether seen from the angle of basic electricity access or green/efficient energy since the understanding of energy poverty is rather contextual. In parts of the Global North, calibrating such poverty may focus on thermal comfort and poor health or death during the winter season.[80] However, 'energy poverty manifestations in the Global South have mainly been focused on supply-side issues related to inadequate access to clean and reliable energy, particularly for lighting, cooling, and cooking.'[81] In any case, there is a clear link between energy poverty and deprivation in Africa – limiting businesses (e.g. machinery),[82] impeding education (e.g., night study),[83] and health concerns stemming from environmental issues (e.g. fumes from generators).[84]

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[77] Republic of Kenya: Ministry of Roads and Transport, 'Kenya Launches National Electric Mobility Policy to Drive a Cleaner, Efficient and Sustainable Transport System' 2 March 2026 <https://www.transport.go.ke/kenya-launches-national-electric-mobility-policy-drive-cleaner-efficient-and-sustainable-transport> accessed 31 March 2026.

[78] Africa Policy Research Institute, 'Pioneering the future of E-Mobility with Kiri EV' <https://afripoli.org/pioneering-the-future-of-e-mobility-with-kiri-ev#:~:text=The%20inception%20of%20Kiri%20EV,also%20known%20as%20tuk%2Dtuks.> accessed 31 March 2026.

[79] Gerald E Arhin, Emmanuel Kofi Gavu and David A Quansah, 'How Just are transition plans? An analysis of the energy transition and investment plans of Ghana and Kenya' (2026) Climate Policy 1, 6.

[80] Paola Velasco-Herrejón, Breffní Lennon and Niall P Dunphy, 'The Global Face of Energy Poverty' in Paola Velasco-Herrejón, Breffní Lennon, and Niall P. Dunphy (eds), *Living with Energy Poverty* (Routledge 2024) 3, 5.

[81] Velasco-Herrejón, Lennon and Dunphy ibid.

[82] Walter Leal Filho, 'Energy poverty in African countries: An assessment of trends and policies' (2024) 117 Energy Research & Social Science 1, 4; Nangayi Guyson, 'The hidden struggle: Exploring the impact of energy poverty in Uganda' Development Aid (9 November 2023) <https://www.developmentaid.org/news-stream/post/170008/energy-poverty-in-uganda> accessed 20 December 2025.

[83] Ibrahim Kekere Sule, Abdulmalik M. Yusuf and Muhammad-Kabir Salihu, 'Impact of energy poverty on education inequality and infant mortality in some selected African countries' (2022) 5 Energy Nexus 1, 3.

[84] Cohen Ang'u, Analysis of energy poverty in Kenya and its implications for human health (2023) 176 Energy Policy 1, 1-2.

The use of renewable energy, for example in a way that mitigates climate change, needs to promote 'complementarity as opposed to competition between Partner States.'[85] Formulating energy policies can be complex especially considering the energy trilemma where there are competing forces from the perspectives of economics, environment, and politics.[86] Such complexity can be mitigated through meaningful regional cooperation underpinned by inclusivity within effective policy and legal frameworks. The significant and sometimes cast differences in national development underscores the need for innovative approaches to regional mutual support. In Kenya, for example, a pivot to clean energy has clearly led to a clear increase in the provision of electricity to more households within a relatively short period.[87] But this contrasts with some other countries in the region.[88] Rwanda has been described as 'the continent leader in terms of the overall best policies towards EV adoption.'[89] Again this contrasts with some EAC members.[90] These are some examples of the 'tremendous variation across East Africa in the legal framework and policy' regarding the fundamentals of the energy industry.[91] Subsequent parts of this article will examine more such differences (and similarities) in detail. It has been contended that such variations, especially when 'combined with the economic consequences of mismanagement of the sector create investment uncertainty.'[92] Addressing or mitigating such uncertainty requires a systematic facilitation of energy transition adopting an integrated and inclusive regional approach.

The Eastern Africa Power Pool (whose vision is 'to optimize the usage of clean energy resources available in the region to benefit the region's society with reduced cost of electricity production and increased rate of access to electrify Eastern Africa')[93] provides strategic regional institutional support.[94] The East Africa Power Pool has the vast potential to promote regional cooperation in a pragmatic manner that mitigates short-term system deficiencies. An overview of the energy mix in the EAC provides an analytical context for the rest of the article with a view to establishing appropriate foundations for promoting a renewable approach to renewable energy that reflects integration and inclusivity.

III. EAC Energy Sectors

The electricity generation mix within the East African Community (EAC) reveals a complex interplay between renewable and non-renewable energy sources, with significant implications for energy security, sustainability, and economic development. The region remains heavily reliant on hydropower, which constitutes the dominant source of electricity generation,

[85] See the comments of the EAC Secretary General at the EAC Headquarters in Arusha (24 November 2023) <https://www.eac.int/press-releases/144-environment-natural-resources/2974-climate-smart-agriculture-and-green-renewable-energy-the-way-to-go-to-mitigate-climate-change-and-boost-food-security> accessed 20 December 2025.
[86] Raphael J Heffron, Darren McCauley, and Gerardo Zarazua de Rubens, 'Balancing the energy trilemma through the Energy Justice Metric' (2018) 229 Applied Energy 1191, 1192.
[87] From 2013-2017, the use of renewable energy led to the increase in electrification essentially doubling from about 28% to 60% <https://borgenproject.org/renewable-energy-in-kenya/> accessed 20 December 2025.
[88] As Part III and Part IV of this article demonstrate.
[89] Obiora A Nnene, Iremitide I. Oyelohunnu and Mark H.P. Zuidgeest, 'Availability of electric mobility policy and its potential for adoption in Africa' (2026) 151 Transportation Research Part D: Transport and Environment 1, 20.
[90] See Part III and Part IV of this article.
[91] Aleem Tharani, 'Harmonization in the EAC' in Emmanuel Ugirashebuja and others, *East African Community Law: Institutional, Substantive and Comparative EU Aspects* (Brill 2017) 486, 487.
[92] Tharani ibid.
[93] The Eastern Africa Power Pool <https://eappool.org/the-eapp-establishment/> accessed 31 March 2026.
[94] ibid (see the 'EAPP objectives').

particularly in countries like Democratic Republic of the Congo (DR Congo), Uganda, and Tanzania. DR Congo has the highest capacity for large-scale hydropower, contributing 2901.52 MW, which underscores the country's vast hydropower potential. Similarly, as seen in Figure 1 (*EAC Energy Mix*), Uganda and Burundi exhibit substantial hydropower capacities (1500 MW and 26.7 MW, respectively), highlighting the critical role of hydropower in meeting the region's electricity demand. However, the over-reliance on hydropower presents significant vulnerabilities due to climate variability, particularly changes in precipitation patterns that could reduce water flow in reservoirs and, consequently, power generation.[95] Such challenges necessitate a more diversified approach to energy generation to safeguard against the impacts of climate change.

In this context, geothermal energy emerges as a promising alternative, particularly in Kenya, where geothermal capacity reaches 968.2 MW.[96] This positions Kenya as a regional leader in geothermal energy, providing a reliable and sustainable source of electricity that is less susceptible to climate-related fluctuations compared to hydropower. Despite its advantages, the potential for geothermal energy remains underutilized in the broader EAC region. Countries like Tanzania, Uganda, and Burundi have yet to harness their geothermal potential, suggesting an opportunity for policy and investment-driven growth in this sector.[97] This argument does not discount the capital-intensive nature of geothermal energy with its long project cycles. But the point is that 'while the initial capital investment for geothermal power plants can be substantial due to exploration and drilling costs, the long-term economic benefits are compelling.'[98] Relatively, solar and wind can offer a much more competitive option that can help to address the huge supply gap that exists in the energy system. Possible intermittency issues may however constitute a trade off as it may be argued that geothermal baseload power offers a stable option.[99] Battery Energy Storage Systems can play a pivotal role with respect to renewable energy use. This can support the grid and help to even out intermittencies from wind and solar.[100]

The growing role of wind and solar energy, particularly in Kenya, signals a shift towards greater diversification of the energy mix. With Kenya generating 436.1 MW from wind and notable investments in solar energy, these sources are beginning to play a more prominent role in the national energy portfolio.[101] However, the intermittent nature of wind and solar power raises challenges regarding grid stability and reliability. Therefore, the integration of these technologies requires significant advancements in energy storage systems and grid infrastructure to ensure a stable and continuous power supply.[102] The small share of solar and

[95] G Khougali 'Reviewing the Energy Security Challenges and Risks in the Eastern Africa Power Pool Grids' (2024) IEEE PES/IAS PowerAfrica 1.
[96] Peter Omenda, Cornell Ofwona, and Peketsa Mangi 'Kenya: The Most Successful Geothermal Development in Africa' (2025) Geothermal Power Generation 863-891.
[97] MD Wamba and Karim Nchare 'Long-term deep geothermal energy reservoir beneath East Africa: Insights from seismic tomography' (2025) 392 Applied Energy 1.
[98] Mukhtar A Kassem and Andrea Moscariello, 'Geothermal energy: A sustainable and cost-effective alternative for clean energy production and climate change mitigation' (2025) 10 Sustainable Futures 1, 14.
[99] Africa Climate Insights, 'Inside East Africa's Untapped Geothermal Goldmine' 18 March 2025 <https://africaclimateinsights.org/inside-east-africas-untapped-geothermal-goldmine/> accessed 31 March 2026.
[100] JEPA Africa, 'Securing the Grid: Battery Storage as a Strategic Asset for East Africa's Clean Energy Transition' 16 March 2026 <https://www.jepaafrica.com/insights/a3u7trwv6vbqdc57ysthzv5o95yyo6> accessed 31 March 2026.
[101] ibid.
[102] Zakaria Reguiez, Ismail Bouyakoub and Fayçal Mehedic, 'Integrated Optimization of Power Quality and Energy Management in a Photovoltaic-Battery Microgrid' (2025) 241 Renewable Energy 1.

wind energy in other countries, such as Uganda and Tanzania, suggests that these technologies have yet to be fully leveraged.

On the other hand, thermal energy sources, particularly natural gas and Heavy Fuel Oil (HFO), continue to play a significant role in the EAC's energy mix, especially in Tanzania, where natural gas contribution is an important element of strategic energy mix projections.[103] While these thermal sources offer reliable and flexible power generation, their environmental impact and long-term sustainability are concerning. The reliance on fossil fuels, coupled with the volatility of fuel prices, exposes the region to energy security risks and undermines efforts to transition towards a low-carbon energy future. HFO and peat also represent less sustainable options.

Renewable energy (excluding large hydropower) constitutes a modest share of the region's total electricity generation. Kenya and Rwanda exhibit the highest shares of renewable energy, reflecting their strong policy commitments to sustainable energy development.[104] In contrast, Tanzania and Uganda have lower shares of renewable energy, particularly when large hydropower is excluded. For instance, Tanzania has only 2% of its generation coming from renewable sources (excluding big hydro), which underscores the challenge of diversifying the energy mix in the country.[105] The low penetration of renewable energy in these countries can be attributed to several factors, including limited investments in renewable technologies, insufficient grid infrastructure, and a continued reliance on large-scale hydropower and thermal power generation.

The policy implications of these findings are manifold. First, there is a pressing need for policy frameworks that incentivise the development of diverse renewable energy sources.[106] Governments should prioritize the scaling up of geothermal, wind, and solar energy projects to reduce dependency on fossil fuels and mitigate the environmental impacts associated with thermal power generation. The establishment of robust financial mechanisms, such as subsidies, tax incentives, and public-private partnerships, will be essential to accelerate investments in renewable energy infrastructure. Furthermore, the harmonisation of energy policies across the EAC countries is crucial to fostering regional cooperation, facilitating cross-

[103]The United Republic of Tanzania, *Key Insights from the United Republic of Tanzania's 2022 Energy Balance* (June 2024) p 2 <https://www.nbs.go.tz/uploads/statistics/documents/en-1742553339-2022%20Energy%20Balance%20-Key%20Insights.pdf> accessed 20 December 2025. HFO contributes much less but still significantly at about 5%: The University of Technology Sydney Institute for Sustainable Futures, Tanzania: Energy Development Plan to Decarbonise the Economy (March 2025) pp 7 and 21 <https://static1.squarespace.com/static/657880dcd408ac495a5cc888/t/67d425cf3425e92d875557de/1741956611623/UTS-Africa-Power-Report-Tanzania-WEB2.pdf> accessed 20 December 2025. Cf Kenya on the use of HFO for 'energy intensive processes' in the industrial sector, see EED Advisory, Draft Final Report Kenya's Transition Beyond Oil and Gas Study p 9 <https://www.energy.go.ke/sites/default/files/DRAFT%20REPORT%20ON%20KENYA'S%20ENERGY%20TRANSITION%20BEYOND%20OIL%20AND%20GAS.pdf> accessed 20 December 2025.

[104] For the view that 'countries like Kenya and Rwanda generate 90% and 53% of their electricity from renewable energy sources, respectively', see Farai Shawn Matiashe, 'Renewables take off in East Africa but tariffs too high for many' African Business (7 November 2025) <https://african.business/2025/11/energy-resources/renewables-take-off-in-east-africa-but-tariffs-too-high-for-many> accessed 20 December 2025.

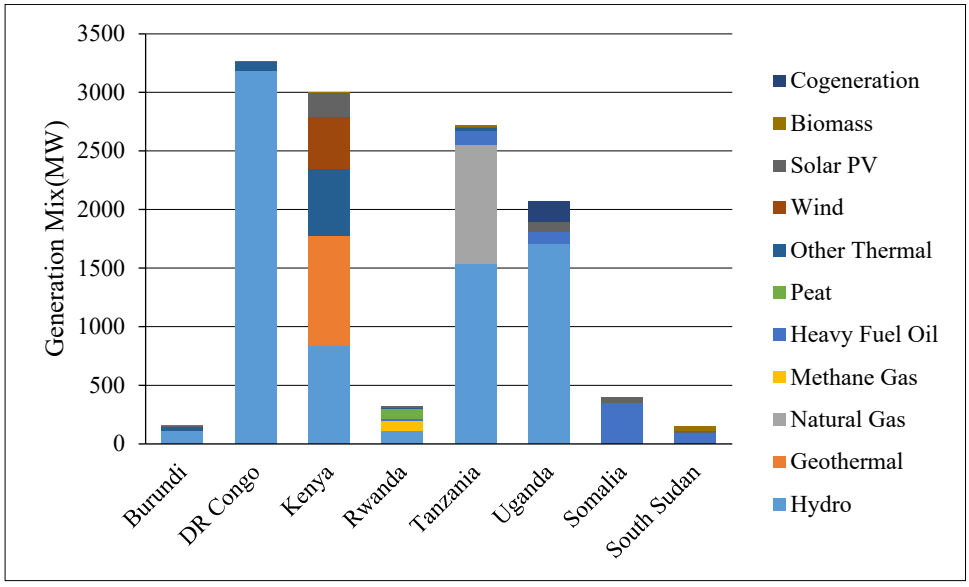
[105] The 2022 energy balance put the use of non-renewables at 99%. The United Republic of Tanzania, *Key Insights from the United Republic of Tanzania's 2022 Energy Balance* (June 2024) p 2 <https://www.nbs.go.tz/uploads/statistics/documents/en-1742553339-2022%20Energy%20Balance%20-Key%20Insights.pdf> accessed 20 December 2025.

[106] Portia Oduro, Ngozi Uzougbo and Munachi Ugwu, 'Renewable energy expansion: Legal strategies for overcoming regulatory barriers and promoting innovation' (2024) 6 (5) International Journal of Applied Research in Social Sciences 927-944.

border energy trading, and optimising the utilisation of shared resources, such as hydropower and geothermal potential.[107]

Additionally, there is a need for strategic investments in energy storage and grid modernisation to support the integration of intermittent renewable sources into national grids. The development of regional energy storage solutions and smart grid technologies will be critical to enhancing the reliability and resilience of the electricity supply, particularly as solar and wind capacities increase. Moreover, the EAC should adopt climate-resilient infrastructure strategies that account for the changing hydrological patterns and reduce the region's vulnerability to droughts and other climate-related disruptions. Such strategies can build on legal certainty which is either inadequate or mostly absent in current frameworks that should contain relevant policy and legal provisions. It is true that non-implementation of policies undermines investor trust.[108] However, there is a need first to develop appropriate policies and laws as this is critical not just to investors but also to the protection of host investment countries.

Figure 1: EAC Energy Mix[109]



IV. EAC Renewable Energy Policies and Laws

This section provides the analytical basis to navigate between policy and law. The previous section on energy sectors shows the potential for clean energy but also disclosed the need for frameworks that will effectively govern such sectors. Such sectors are considered through the lenses of energy efficiency, electric mobility, and green hydrogen energy policy. As noted earlier, these themes are increasingly significant in EAC regional and African discussions at a high strategic level. For example, at the 38th African Union Summit, African leaders endorsed strategies which the Transport and Energy ministers had discussed in December 2024 (centred

[107] ME Rubanda and others, 'Energy market integration: Harmonizing tariff recourse policies in East Africa' (2023) 84 Utilities Policy 1.
[108] Ibrahim Kipngeno Rotich, Hilda Chepkirui, and Peter K Musyimi 'Renewable energy status and uptake in Kenya' (2024) 54, Energy Strategy Reviews 1.
[109] Most of the global and continental reports do not have updated data. The regional reports from EREA contain updated information from which a compilation had been done. EREA Reports. The Electricity & Renewable Energy Portfolio Committee <https://energyregulators.org/wp-content/uploads/2026/01/EREPC-Report-_-December-2024.pdf> accessed on 6 January 2026.

around sustainable aviation fuels, green hydrogen, energy efficiency, and climate-smart infrastructure).[110]

1. Energy Efficiency

Table 1 (*Status of Energy Efficiency in Regulatory Authorities*) indicates the status of energy efficiency in National Regulatory Institutions (NRIs) across the East African Community (EAC) and highlights notable disparities in policy implementation, institutional capacity, and regulatory enforcement. Kenya and Rwanda stand out as leaders in the region, having established comprehensive frameworks that include Minimum Energy Performance Standards (MEPS), mandatory audits, and penalty systems for non-compliance. However, other Partner States, such as Burundi and Tanzania, have significant gaps, with limited institutional structures, voluntary standards, and inadequate regulatory enforcement.

Kenya has a robust energy efficiency legal and regulatory regime. Based on relevant statutory framework, the Energy and Petroleum Regulatory Authority (EPRA) drives the law and policy implementation interface. Among many functions,[111] the EPRA is vested with the powers to 'co-ordinate the development and implementation of a national energy efficiency and conservation action plan, in consultation with relevant statutory authorities and other stakeholders.'[112] The EPRA's function is also to align with international needs as it also required to develop guidelines on relevant treaties that concern the energy sector.[113] The Act has the potential to facilitate the attainment of energy targets although it has been argued that 'energy nexus aspects' are deficient without ministries such as health, education etc.[114] Whilst an inclusive and collaborative approach is needed domestically, it is also critical to do that within a regional context.

Energy audits are required for commercial, industrial, and institutional facilities consuming over 180,000 kWh annually.[115] This also helps to identify opportunities for energy efficiency improvements. The legal framework further encompasses the licensing of energy auditors, audit firms, energy managers, and Energy Service Companies (ESCOs), while promoting energy performance by setting consumption benchmarks across various consumer categories.[116] A cornerstone of this framework is the enforcement of Minimum Energy Performance Standards (MEPS) for electrical appliances and equipment, ensuring that energy use is optimised across all sectors.[117]

Kenya has instituted several key regulations to operationalise this legislative vision. The Energy (Energy Management) Regulations of 2025 primarily target medium to large-scale

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[110] African Union Commission, 'African Union Summit Adopts Bold Strategies for Clean and Sustainable Energy and Transport Pathways' <https://au.int/en/pressreleases/20250219/african-union-summit-adopts-bold-strategies-clean-and-sustainable-energy-and> accessed on 6 January 2026.
[111] See generally s10 of the 2019 Energy Act.
[112] S 10(a)(ll) of the 2019 Energy Act.
[113] Except nuclear energy. See s 10(a)(kk).
[114] Alliance of Civil Society Organisations for Clean Energy Access, Scaling Up National and Sub-national Progress Towards SDG 7 in Kenya (Clean Cooking and Electrification) Analysis of the Energy Act No.1 of 2019: Mapping Out Key Entry Points for CSOs Influencing (Discussion Paper, 2019) <https://access-coalition.org/wp-content/uploads/2020/06/Energy-Act-analysis-Final.pdf> accessed 17 October 2025.
[115] Kenyan Energy (Energy Management) Regulations, 2025 s 5.
[116] ibid pt VIII of the Act.
[117] ibid pt VI of the Act.

energy consumers, ensuring systematic energy management practices.[118] Complementing this, the Energy (Appliances Energy Performance and Labelling) Regulations of 2016 mandate MEPS and energy labelling for appliances such as electric motors, household refrigerators, non-ducted air conditioners, and lighting devices.[119] In addition, Kenya has developed the Energy Efficiency and Conservation Strategy (2021)[120] and the Energy Efficiency and Conservation Action Plan,[121] alongside international standards derived from the ISO 50001 series,[122] all of which underscore the nation's commitment to sustainable energy practices. Kenya's Climate Change (Carbon Markets) Regulations 2024 goes as far as to 'provide guidance on annual social contribution for carbon projects'.[123] Nevertheless, it is necessary to establish 'clearer roles for community representatives within the regulatory and oversight frameworks, which would strengthen inclusivity.'[124] Fundamentally, Regulations are forms of subordinate legislation which must conform to relevant primary legislation.[125] Therefore, a more systemic approach is needed to legal frameworks. This approach requires a review of the Energy Act 2019 to align with the Reviewed Energy Policy.[126]

An important lesson that can be drawn for other EAC countries is the 'energy management philosophy' in which regard 'facilities focus on the behavioural, technological, legal and financial spectrums of energy procurement and use.'[127] This underscores the argument earlier made that law and policy are complementary and that both areas are situated within a broader or overarching energy developmental construct.

Uganda has only recently taken the need for a legal framework regarding energy efficiency to the front burner.[128] Otherwise, as recently as 2023, it was observed that 'the absence of a legal framework for energy efficiency has stalled important measures' in Uganda.[129] The country's experience is a good example of how developing quality policy and legal frameworks is just as important as developing any at all. Progressing the Energy Efficiency and Conservation Bill to

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[118] ibid s 3.
[119] Kenyan Energy (Appliances Energy Performance and Labelling) Regulations, 2016.
[120] Kenyan Ministry of Energy, *Energy Efficiency and Conservation Strategy*, 2020/2021 <https://unepccc.org/wp-content/uploads/2020/09/kenya-national-energy-efficiency-and-conservation-strategy-2020-1.pdf> accessed 6 January 2026.
[121] Kenyan Ministry of Energy, Kenya *Energy Efficiency and Conservation Action Plan: Implementation Plan* (2022) <https://energy.go.ke/sites/default/files/KAWI/Publication/KNEECS%20Implementation%20Plan29.11.21.pdf> 6 January 2026.
[122] ISO 50001 series - International Standards for Energy Management Systems.
[123] Kenya's Climate Change (Carbon Markets) Regulations 2024 art 3(c).
[124] Roula Inglesi-Lotz and others, *A Pathway Towards Just Carbon Markets: A Legal and Policy Guide for African Countries* (Report Commissioned by the Environmental Lawyers Collective for Africa (Natural Justice): Prepared by the Centre for Environmental Justice for Africa 2025) p 61 https://naturaljustice.org/wp-content/uploads/2025/07/CARBON-MARKETS-REPORT_Submitted_Natural-Justice.pdf
[125] Kenya Law Reform Commission, *A Guide to the Legislative Process in Kenya* (2015) 42-43 <https://klrc.go.ke/images/images/downloads/klrc-a-guide-to-the-legislative-process-in-kenya.pdf
[126] Ministry of Energy and Petroleum State Department, National Energy Policy 2025-2034 para 4.2 <https://www.energy.go.ke/sites/default/files/Final%20Draft%20%20National%20Energy%20Policy%2018022025.pdf> accessed 20 December 2025.
[127] See the 'Background to the Regulations' in the Energy (Energy Management) Regulations, 2021. <https://www.epra.go.ke/sites/default/files/2024-11/Regulatory%20Impact%20Statement.pdf> accessed 17 October 2025.
[128] Energy Efficiency and Conservation Bill 2024.
[129] IEA, 'Uganda 2023: Executive summary' <https://www.iea.org/reports/uganda-2023/executive-summary> 17 October 2025.

enactment has been significantly delayed.[130] Some of the reasons for rejecting the Bill are very significant considering their implications for inclusivity and a just transition. For example, it was contended that 'the Bill prioritises a small fraction of the population connected to the grid while ignoring the majority dependent on biomass.'[131] For example, the argument continued, maximum efficiency 'will only benefit those using electricity.'[132] Existing law does not 'explicitly address energy efficiency and conservation issues', and therefore requires 'legal, institutional and regulatory framework for energy efficiency and conservation in Uganda.'[133] However, there is no reference to international or regional cooperation. The Bill in furtherance of a national cooking strategy that the Minister should develop is also required to 'provide for financial mechanisms, incentives and subsidies to make efficient clean cooking technologies and fuels more affordable for low-income households.'[134] However, such nuance and potentially inclusive approach seem essentially absent regarding energy efficiency in the transportation sector.[135] Although a general energy efficiency and demand-side management made Uganda more internationally competitive,[136] the absence of appropriate legal framework remains a significant gap. In Uganda, MEPS for appliances such as air conditioners, lighting, electrical motors, and refrigerators have been developed but not legislated; however, these standards are voluntary, leading to limited implementation.[137]

In contrast, Tanzania is making significant strides through its collaboration with the United Nations Industrial Development Organization (UNIDO) to develop initial MEPS, marking a pivotal moment in the country's energy efficiency journey.[138] Tanzania has also recognised the need for energy efficiency, but this has been woven into more overarching and rather long-term strategies. Such strategies will hopefully lead to some positive outcomes such as enabling law, regulations and guidelines to facilitate the adoption of clean cooking solutions.[139] This approach reflects a more systemic need to develop a sustainable pathway to energy efficiency across the board. For example, the government has admitted that 'the present version of building bylaws has limited or no mention of energy efficiency'.[140] An inclusive approach is also necessary.

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[130] Prisca Nwanyenya, 'House Rejects Energy Efficiency Bill for Ignoring Uganda's Real Power Crisis' Parliament Watch (27 September 2025) <https://parliamentwatch.ug/news-amp-updates/house-rejects-energy-efficiency-bill-for-ignoring-ugandas-real-power-crisis/> accessed 17 October 2025.

[131] Comment attributed to Leader of the Opposition. See Prisca Nwanyenya, 'House Rejects Energy Efficiency Bill for Ignoring Uganda's Real Power Crisis' Parliament Watch (27 September 2025) <https://parliamentwatch.ug/news-amp-updates/house-rejects-energy-efficiency-bill-for-ignoring-ugandas-real-power-crisis/> accessed 20 December 2025.

[132] Energy Efficiency and Conservation Bill 2024 (Memorandum para 2).

[133] ibid (Memorandum para 3(a)).

[134] ibid s 18(3)(e).

[135] ibid ss 19-25.

[136] Ministry of Energy and Mineral Development (MEMD), <https://www.un.org/esa/sustdev/csd/casestudies/e3_uganda.pdf> accessed 20 December 2025.

[137] Agarwal Shreya and others, 'Implementation Strategy-Efficiency Standards and Labeling Programs in Uganda' <https://eta.lbl.gov/publications/implementation-strategy-efficiency> accessed 17 October 2025.

[138] Tanzania Energy Efficient Plan <https://www.energyefficiency.co.tz/services/development-of-professional-qualifications-and-skills-in-energy-management-and-audit> accessed 17 October 2025.

[139] See generally, the National Charcoal Strategy and Action Plan (2021-2031) and the National Clean Cooking Strategy (2024-2034): <https://www.nishati.go.tz/uploads/documents/en-1735027405-National%20Energy%20Efficiency%20Strategy%202024_2034-MOE.pdf> (Page 4) accessed 17 October 2025.

[140] United Republic of Tanzania Ministry of Energy, 'National Energy Efficiency Strategy' <https://www.nishati.go.tz/uploads/documents/en-1735027405-National%20Energy%20Efficiency%20Strategy%202024_2034-MOE.pdf> (Page 33) accessed 17 October 2025.

In a 2022 report, it was observed that Rwanda lacked specific law regulating the specific use of energy and its conservation.[141] However, the country has fared far much better than many countries in the EAC regarding a legislative approach to renewable energy and aspects of its regulation. For example, in 2012 Rwanda laid down regulations on renewable energy feed in tariff. [142] One of the objectives of the 2012 Regulations was to 'create a critical mass of renewable energy investment and support the establishment of a self-sustaining market.'[143] The regulatory authority was also given the responsibility to verify the production of renewable energy.[144] Rwanda has also taken proactive steps by establishing MEPS for refrigerators, air conditioners, and lighting, in addition to ministerial guidelines that serve as a blueprint for energy auditing practices.[145]

In Somalia, the inadequacy of laws is one of the factors that undermine the implementation of policies in the context of 'market efficiency, generation and reliability'.[146] Under the Act the National Electricity Authority (NEA) ensures that provisions of the Electricity Act 2022 are enacted efficiently and transparently.[147] In signing the Act, the President observed that electricity should be 'sustainable, cost-effective, and beneficial to our environment.'[148]

At the core of regional energy management, the monitoring of utility energy efficiency remains a critical metric, tracked monthly by the National Regulatory Institutions (NRIs) across the East African region.[149] While each NRI has set specific energy efficiency targets, only Uganda, Rwanda, Tanzania, and Kenya have instituted reward and penalty schemes that incentivize utilities to meet prescribed efficiency thresholds, fostering enhanced accountability and driving improved energy performance within their respective power systems.[150]

On a broader regional scale, the East African Centre of Excellence for Renewable Energy and Efficiency (EACREEE), an institution collaborating closely with the East African Community (EAC), is playing a leading role in shaping the regional energy landscape. EACREEE has developed an EAC Energy Efficiency Policy aimed at harmonising regional efforts and fostering sustainable energy practices across Partner States. A key milestone in this endeavour

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[141] The World Bank, 'Energy Efficiency Potential Assessment for Rwanda' (2022) <https://documents1.worldbank.org/curated/en/099110923095031312/pdf/P1774290474e8c0de0bf3e0855d61992873.pdf> accessed 17 October 2025.

[142] See Regulations N° 001/Energy/RURA/2012 of 09/02/2012 on Rwanda Renewable Energy in Tariff. [These regulations were made considering Law N° 39/2001 of 13 September 2001 establishing the Rwanda Utilities Regulatory Agency; and Law N° 21/2011 of 23/06/2011 governs electricity in Rwanda.] For an overview of relevant policies, law and regulations, see Rwanda Energy Group, *Policies & Regulations* <https://www.reg.rw/public-information/policies-regulations/?itemPerPage=30&cHash=bbcd8c8df2734436c5e43ceae9c27b6e> accessed 17 October 2025.

[143] ibid art 3 (3.1)(vi).

[144] ibid art 18(18.1)(ii).

[145] Stephane de la Rue du Can and others, 'Energy efficiency improves energy access affordability' (2022) (70) Energy for Sustainable Development 560-568.

[146] Abdullahi Mohamed Samatar, 'The utilisation and potential of solar energy in Somalia: Current state and prospects' (2023) 48 Energy Strategy Reviews 1, 10.

[147]The Federal Government of Somalia, 'The [President] Signed the National Electricity Act' (Report March 8, 2023) <https://moewr.gov.so/ova_doc/somalia-electricity-act/#:~:text=March%208%2C%202023%2C%20Mogadishu%2C,importantly%2C%20empower%20our%20communities.%E2%80%9D> (accessed 17 October 2025).

[148] ibid.

[149] REN21, EAC Renewable Energy and Energy Efficiency Regional Status Report 2016 <https://www.ren21.net/wp-content/uploads/2019/05/REN21-EAC-web-EN.pdf.pdf> accessed 9 April 2026. There have been no significant changes since that report.

[150] ibid.

is the adoption of a general lighting standard, which has been established at the EAC level. Responsibility for enforcing these standards lies with the individual NRIs, ensuring tailored implementation strategies that suit the unique contexts of each Partner State. Additionally, the Energy Regulators Association of East Africa (EREA) supports the regional harmonisation of these frameworks and as well as supporting in sustainable capacity building through the Energy Regulation Centre of Excellence (ERCE).[151]

Table 1:Status of Energy Efficiency in Regulatory Authorities[152]

SNO	METRIC	Burundi	Kenya	Rwanda	Tanzania	Uganda	South Sudan	DRC	Somalia
1.	Established Energy Efficiency Institutional Setup	None	Yes	Yes	None	None	None	None	None
2.	Energy Law empowers NRIs to regulate Energy Efficiency	No	Yes	No	No	No	None	Yes	Yes
3.	Specific Regulations, strategies and plans developed for Energy Efficiency	None	Yes	Yes	None	None	None	Yes	None
4.	Developed Minimum Energy Performance Standards	None	Yes	Yes	None	Yes	None	None	None
5.	Adopted Mandatory Standards and Labelling Requirements	No	Yes	Yes	No	No	None	No	None
6.	Set Targets for Utility Efficiency	No	Yes	Yes	Yes	Yes	None	No	None
7.	Utilities penalized for not meeting energy efficiency targets	No	Yes	Yes	Yes	Yes	No	No	None
8.	Development of public and non-motorized transport in major towns and cities	No	No	Yes	No	No	No	No	None
9.	Development and adoption of voluntary MEPS for liquefied petroleum gas (LPG) cookers and improved household biomass cookstoves	No	Yes	No	Yes	No	No	No	None

This uneven progress impedes the region's broader energy transition goals and underscores the need for harmonised policy action, capacity development, and technological innovation. Kenya’s leadership in energy efficiency is evidenced by its comprehensive energy law that mandates audit, enforces MEPS for appliances and industrial equipment, and includes labelling requirements. Rwanda follows closely with a strong institutional framework but faces challenges in scaling and enforcing these measures effectively. By comparison, the lack of established energy efficiency institutions in countries such as Burundi and Tanzania represent

[151] EAC Energy Union <https://energyregulators.org/eac-energy-union/> accessed 17 October 2025.

[152] EREA Electricity & Renewable Energy Portfolio Committee Report of June 2024 <https://energyregulators.org/wp-content/uploads/2026/01/EREPC-Report-_-June-2024.pdf> accessed 6 January 2026.

a critical bottleneck, as foundational measures are necessary to promote efficiency gains and attract investment.

The absence of mandatory MEPS across much of the region limits market transformation, as voluntary standards do not provide sufficient incentives for the widespread adoption of energy-efficient technologies. The regional disparities reflect challenges observed globally in energy efficiency policy adoption. Lessons from Europe and North America provide valuable insights into overcoming these barriers. For instance, the European Union (EU) has implemented the Energy Efficiency Directive, mandating national energy efficiency action plans, stringent MEPS, and energy labelling for products across all Partner States.[153] The Directive also requires large enterprises to conduct energy audits and set binding targets for energy savings. This coordinated approach has facilitated the widespread adoption of energy-efficient technologies and practices, particularly in industrial sectors. Similarly, the United States has achieved significant energy savings through its Energy Policy and Conservation Act, which introduced MEPS for appliances and vehicles, as well as financial incentives like tax credits for energy-efficient building upgrades.[154] These policies have proved to be instrumental in driving market transformation while fostering technological innovation. East African countries may, in principle, draw inspiration from these examples to strengthen their energy efficiency landscapes. However, appropriate contextualisation is crucial. The success of energy efficiency measures in the EU and US is hinged on well-established systems of enforcing compliance with energy efficiency obligations. Moreover, whilst energy appliances are cost effective in the long term, not many households or businesses in the EAC region can afford the initial cost of purchasing these appliances.[155] Hence, the socio-economic conditions of EAC nationals are critical to the success of economic efficiency measures without which inclusivity would be undermined or scarcely attainable. Economic empowerment, local capacity, and well managed robust investment in infrastructure form an important developmental matrix for effective implementation of energy efficiency laws and policies when set up.

Harmonised regional policies, modelled after the EU Energy Efficiency Directive (subject to appropriate socio-economic and political contextualisation), could establish a unified framework for energy efficiency standards, labelling, and monitoring across the EAC. This would reduce market fragmentation and enable economies of scale for energy-efficient technologies. Moreover, introducing binding energy-saving targets would provide clear goals for national governments and create accountability mechanisms to ensure progress. The adoption of advanced technologies also holds promise for enhancing energy efficiency outcomes.

In the United States, the widespread use of smart grids has enabled real-time energy monitoring and optimisation, particularly in urban areas.[156] Integrating such technologies in East Africa, subject to the sort of contextualisation discussed earlier, could significantly improve utility efficiency and enable better demand-side management. Rwanda's efforts to incorporate smart meters and grid systems offer a starting point for the region to scale such innovations. Generally, introducing smart grids (which Battery Energy Storage Systems could anchor)

[153] Directive (EU) 2023/1791.
[154] Inflation Reduction Act of 2022 s 50122(3).
[155] Farai Shawn Matiashe, 'Renewables take off in East Africa but tariffs too high for many' African Business (7 November 2025) <https://african.business/2025/11/energy-resources/renewables-take-off-in-east-africa-but-tariffs-too-high-for-many> accessed 20 December 2025.
[156] IoT Analytics, Smart Electricity Meter Market 2024: Global Adoption Landscape (21 February 2024) <https://iot-analytics.com/smart-meter-adoption/> accessed 13 October 2025.

should contribute to grid level efficiency – promoting rapid supply and growth.[157] This approach will support energy efficiency.

Additionally, establishing energy efficiency funds, as seen in Germany's KfW energy efficiency programs, could provide financial support to industries and households for retrofitting and adopting energy-efficient technologies.[158] Educating consumers about the economic and environmental benefits of efficient appliances and practices would create demand-driven momentum for policy adoption. Complementing these efforts with fiscal incentives, such as tax rebates for energy-efficient equipment and subsidies for renewable energy integration, would further encourage compliance and innovation.

Promoting energy efficient products and facilities also has direct implications for poverty alleviation. This is a point hardly discussed in relevant literature. Energy-efficient products reduce poverty by decreasing domestic and commercial energy costs.[159] This is particularly so for low-income households and small businesses in rural areas.[160] Regional organisations and institutions can promote such awareness. For example, regional collaboration through the East African Centre of Excellence for Renewable Energy and Efficiency (EACREEE), the Regional Association of Energy Regulators for Eastern and Southern Africa (RAERESA) and EREA can serve as a vital mechanism for sharing best practices, coordinating policy development, and pooling resources for impactful initiatives regarding energy efficiency. There is a strong argument that policy and regulatory frameworks should however not worsen pre-existing disparities.[161] In the context of electric vehicles for example, there is a need to adopt 'a more egalitarian approach to policy development' rather than merely benefitting the wealthy minority. [162]

2. Electric Mobility

The transportation sector in the East African Region has grown over the past years, particularly in the urban areas, leading to an increase in the number of vehicles. This has led to increased petrol and diesel consumption and hence increased environmental pollution.

In recent years, the use of other forms of energy to provide motive power that is considered less expensive and more environmentally friendly emerged, Compressed Natural Gas (CNG) and electricity being among them. In Tanzania, for example, some vehicles have been converted to use CNG.[163] Table 2 (*Assessment of the current E mobility in EAC*) shows the e-mobility situation in the EAC.

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[157] See generally JEPA Africa, 'Securing the Grid: Battery Storage as a Strategic Asset for East Africa's Clean Energy Transition' <https://www.jepaafrica.com/insights/a3u7trwv6vbqdc57ysthzv5o95yyo6> accessed 31 March 2026.

[158] Kreditanstalt für Wiederaufbau (KfW), Sustainability Guideline: Assessment and Management of Environmental, Social, and Climate Aspects (July 2024) <https://www.kfw-entwicklungsbank.de/PDF/Download-Center/PDF-Dokumente-Richtlinien/Nachhaltigkeitsrichtlinie_EN.pdf> accessed 13 October 2025.

[159] EELA, 'Setting standards for energy efficiency' <https://eela-project.org/node/164> accessed 13 October 2025

[160] ibid.

[161] Birhanu Bayissa Gicha, 'The electric vehicle revolution in Sub-Saharan Africa: Trends, challenges, and opportunities' (2024) 53 Energy Strategy Reviews 1, 6.

[162] ibid 7.

[163] Gerutu Bosinge Gerutu, Kenedy Greyson and Pius Chombo, 'Compressed Natural Gas as an Alternative Vehicular Fuel in Tanzania: Implementation, Barriers, and Prospects' (2023) 2 Methane 66.

Table 2: Assessment of the current E mobility in EAC[164]

	Status					**Policy/ Strategy**	**Incentive**
	E-Train	2-Wheelers	3-Wheelers	4-Wheelers	E-Buses		
Burundi	No	No	No	No	No	No	No
Kenya	No	Yes	Yes	Yes	Yes	Under development	Import duty exemption
Rwanda	No	Yes	Yes	Yes	Yes	Some strategies are in place	Special Electricity tariff for charging stations Tax exemption
Tanzania	Yes	Yes	No	Yes	No	No	Tax exemption
Uganda	No	Yes	No	Yes	Yes	Under development	No
Zanzibar	Yes	Yes	Yes	No	No	No	No
Somalia	No	No	No	No	No	No	No
DRC	No		No	Yes	No	Under development	
South Sudan	No	No	No	No	No	No	No

As assessed in Table 2 (*Assessment of the current E mobility in EAC*), the deployment of electric mobility in the Region is still in its infant stage, hence there is a need to develop policy strategies and incentives to expedite roll out of electric mobility. But there is also a need for legal frameworks to govern e-mobility in a comprehensive manner which is largely absent across the region. In some countries including Kenya, Tanzania and Uganda, there has been tangential statutory support at best. For example, the Kenyan Finance Act 2023 essentially concerns taxes and duties.[165] Ugandan National Environment Regulations 2020 focus on waste management although it mandates compliance with environmental principles to ensure resource efficiency (among other things).[166] There is a need for clear and specific legal frameworks to govern e-mobility. It is necessary to differentiate between laws and policies which is sometimes absent in the literature.[167] Otherwise, the need to develop relevant laws may be undermined. Clearly, the legal and regulatory framework is uncertain.[168]

The status of e-mobility across the analysed countries varies significantly, with some making notable progress and others lagging. The focus primarily lies on 2-wheelers, 4-wheelers, and e-buses, with limited adoption in 3-wheelers and e-trains. There is significant analytical value

[164] EREA Reports. The Electricity & Renewable Energy Portfolio Committee <https://energyregulators.org/wp-content/uploads/2026/01/EREPC-Report-_-December-2024.pdf> accessed on 06 January 2026.
[165] Finance Act No 4 of 2023.
[166] The National Environmental (Waste Management) Regulations 2020 No 49 s 4(d). See also s 35(1).
[167] For references to the National Environment Act 2019 and the National Environment (Waste Management) Regulations 2020 as part of 'various policies' in Ugandan such as the E-Waste Management Policy, the E-Waste Management Strategic Plan and the E-Waste Guidelines 2016, see CISL, Pathways to e-mobility transitions in Uganda: Policy brief on transition to electric mobility' <https://www.cisl.cam.ac.uk/files/pathways_to_e-mobility_transition_in_uganda.pdf> (p 8) accessed 17 October 2025.
[168] Gicha (n 161) 6.

in categorising the countries based on their level of advancement in e-mobility and highlights key observations concerning initiatives and policies.

Kenya and Rwanda lead the region in e-mobility initiatives. Kenya has achieved comprehensive adoption across 2-wheelers, 3-wheelers, 4-wheelers, and e-buses.[169] It also benefits from policies such as import duty exemptions and strategies for e-bus development. Similarly, Rwanda shows strong adoption and provides incentives like tax exemptions and special electricity tariffs for charging stations, positioning itself as a regional leader.

Tanzania and Uganda have made moderate progress. Tanzania is active in 2-wheelers, 4-wheelers, and e-trains, supported by policies and tax exemptions, though adoption of 3-wheelers and e-buses remains limited.[170] Uganda focuses on 2-wheelers, 4-wheelers, and e-buses, with strategies under development but no significant incentives to drive growth.[171] Zanzibar has seen the adoption of 2-wheelers, 3-wheelers, and e-trains but lacks policies and incentives, which may hinder future progress.[172] Such aspirations, however, raise inclusivity issues. It is important that targeted progress is not reduced to energy elitism or perceived as such. This would otherwise contradict the EAC Treaty enabling 'measures to supply affordable energy to their people taking cognisance of the protection of the environment'.[173] As earlier noted in the case of Uganda, opponents argued that the Energy Efficiency and Conservation Bill benefitted a small fraction of the population regrading electric vehicles.[174]

Burundi, Somalia, and South Sudan have made minimal advancements, with no reported adoption or initiatives regarding e-mobility. Similarly, the Democratic Republic of Congo (DRC) has limited adoption, with 4-wheelers and e-buses under development but no broader strategies or policies. Nevertheless, the DRC has joined Morocco and Zambia to outline a 'joint e-mobility roadmap'.[175] The DRC's strategy of articulating a road map with countries and southern Africa may seem a bit odd considering regional integration commitments. But this may reflect the EAC's incoherence or tardiness in developing a regional approach to such

[169] Emmanuel Uzim and James Dixon, 'Macroeconomic impacts of African transport transitions: on the case of electric two-wheelers in Kenya' (2024) 2 African Transport Studies 1.
[170] Gabriel Clement Malima and Francis Moyo, 'Are electric vehicles economically viable in sub-Saharan Africa? The total cost of ownership of internal combustion engine and electric vehicles in Tanzania' (2023) Transport Policy 14.
[171] Ministry of Science, Technology, and Innovation (Uganda), National E-Mobility Strategy (July 2024) <https://sti.go.ug/wp-content/uploads/2024/07/National-E-Mobility-Strategy.pdf> accessed 13 October 2025.
[172] Gabriel Clement Malima and Francis Moyo, 'Are electric vehicles economically viable in sub-Saharan Africa? The total cost of ownership of internal combustion engine and electric vehicles in Tanzania' Transport Policy 14.
[173] Treaty Establishing the East African Community 1999, art 101(1)(f).
[174] See Prisca Nwanyenya, 'House Rejects Energy Efficiency Bill for Ignoring Uganda's Real Power Crisis' Parliament Watch (27 September 2025) <https://parliamentwatch.ug/news-amp-updates/house-rejects-energy-efficiency-bill-for-ignoring-ugandas-real-power-crisis/> accessed 20 December 2025.
[175] This was articulated, with the support of the United Nations Commission for Africa, at the ECA 'High-Level Policy Dialogue on the Development of Automotive Regional Value Chains and E-Mobility' held in Zambia on 12 December 2024. See UNECA, 'With ECA Support, Morocco, the DRC and Zambia Outline Joint E-mobility Roadmap': <https://www.uneca.org/stories/with-eca-support%2C-morocco%2C-the-drc-and-zambia-outline-joint-e-mobility-roadmap> accessed 17 October 2025.

issues. Political and security expediencies have a significant impact on the DRC's short-term or mid-term decisions,[176] since it has about 70% of global cobalt reserves.[177]

Kenya and Rwanda stand out for their proactive incentives, including tax exemptions and electricity tariffs for charging infrastructure.[178] However, e-trains are adopted only in Tanzania and Zanzibar, signalling a limited focus on rail transport electrification.[179] E-buses show potential in Kenya and Rwanda but are still in the development phase, highlighting a gap in urban public transport electrification.[180]

The development of relevant policy and regulatory frameworks is at the heart of sustainable development. Only Kenya, Rwanda, Uganda and the DRC have made significant strides in this regard. To advance e-mobility, countries like Burundi, Somalia, and South Sudan need to prioritize the development of policies and strategies. Regional collaboration can help to share best practices and foster technological advancements. Investments in charging stations and infrastructure are crucial, particularly in countries showing early progress, such as Uganda and Zanzibar. Expanding incentives, akin to Rwanda's electricity tariff initiative, could significantly boost adoption across the region.

This situation presents opportunities for investment and reducing environmental impacts caused using petroleum products for the transportation sector. It also presents an opportunity to increase the productive use of electricity. So far, there is a situation where e-mobility (where existent) in the region seems to emerge and develop ahead of or without sufficient policy and legal frameworks. Even where policies exist, they lack an integrative approach in a way that should demonstrate synergy between relevant domestic policies. In the Kenyan context, for example, 'the Finance Act excludes some [electric vehicles] models and spare parts from the exercise of duty reduction, impeding uptake and usage.'[181] There are also safety issues for two- and three-wheelers.[182] An overarching and coherent approach is critical to ensuring a smooth transition to e-mobility. Specific legislative framework will provide a more secure basis to develop an appropriate regime where laws and policies can function in a complementary manner. Such legislation will also reduce the risk of contradictions between different laws on somewhat different but related aspects of e-mobility. As a secondary energy carrier, hydrogen can promote zero-emission mobility.[183]

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[176] Divin-Luc Bikbanya, 'Due Diligence in Mineral Supply Chains from the Democratic Republic of Congo' (2023) E-International Relations 1, 3-4. <https://repository.uantwerpen.be/docman/irua/1d5098/due_diligence_in_mineral_supply_chains_from_the_democratic_republic_of_congo.pdf> accessed 17 October 2025; see also Bossissi Nkuba and Liliane Kabagale, 'Between M23 and electric vehicles' (*Africa is a Country,* 17 April 2024).

[177] Cobalt Institute, *Responsible Sourcing* <https://www.cobaltinstitute.org/cobalt-sourcing-responsability/> accessed 17 October 2025.

[178] Tania Khan and others, 'Zero-emission vehicle deployment: Africa' (ICCT 2022) 3 <https://theicct.org/wp-content/uploads/2022/04/africa-hvs-zev-deploy-africa-apr22.pdf> accessed 13 October 2025.

[179] International Energy Agency (IEA), Global EV Outlook 2024 (IEA 2024) 15 <https://www.iea.org/reports/global-ev-outlook-2024> accessed 13 October 2025.

[180] ibid.

[181] ZE-Mobility, *Accelerating e-mobility in East Africa –A case for Kenya* (Policy Brief, 2023) 1, 9 <https://assets.foleon.com/eu-central-1/de-uploads-7e3kk3/48218/ze-mobility_policy_brief_final__.67259de8d765.pdf> accessed 17 October 2025.

[182] ibid 12.

[183] Amela Ajanovic, 'Electricity vs hydrogen in the transition towards sustainable mobility' (2023) 2 Oxford Open Energy 1, 4.

3. Green Hydrogen Energy Policies and Laws

Africa's economic growth has continued to experience an upward trend hence resulting in an increase in the demand of energy. The notion of using hydrogen for transportation is not new, although the significant investments required for appropriate infrastructure have been rather prohibitive.[184] Crucially also, relevant policy and legal frameworks are necessary to support and drive effective development. According to the African Green Hydrogen Report of 2025:

> 'By February 2025, eight African countries (Algeria, Egypt, Kenya, Mauritania, Morocco, Namibia, South Africa and Tunisia) have adopted hydrogen strategies and/or roadmaps, but lack the required comprehensive regulatory frameworks to translate these strategies into action. In the absence of such frameworks, GH2 project implementation may face significant delays, reduced investor confidence, and limited scalability.'[185]

If clean hydrogen starts to play a bigger part in the world's energy mix, incorporating it will be relatively easy from a technical standpoint. Indeed, 'clean hydrogen could meet up to 12% of final energy consumption by 2050.'[186] This can prove to be strategic in Africa where about 600 million people – 43% of Africa's population do not have access to electricity.[187]

However, Africa's potential for colossal energy capacity from solar and wind energy could accelerate the harnessing of low-carbon hydrogen. Hydrogen is a highly energy-dense element that does not contribute to atmospheric warming when consumed as a fuel, producing only water as a byproduct.[188] Projections regarding Africa's potential energy landscape indicate a substantial capacity for hydrogen production. This positions Africa as a potentially pivotal future supplier in a global decarbonized energy system.[189] The absence of supply-side uncertainty regarding solar and wind should encourage large anchor projects that can reduce investment risk while maximising renewable energy production. Projections suggest that the African continent possesses the potential to produce nearly 5,000 megatons of hydrogen annually. This vast capacity is estimated to be sufficient to meet the equivalent of the entire global total energy supply today.[190] Such yield is compounded by the presence of key minerals reserves of reserves of cobalt, manganese and platinum – key minerals for batteries and hydrogen technologies.

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[184] This is in addition to certain technical challenges e.g., the reliability and durability of fuel cells. See Ajanovic ibid 4.

[185] Theoneste Uhrorakeye and others, *African Green Hydrogen Report* (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, May 2025) P 24 <https://ptx-hub.org/wp-content/uploads/2025/06/African-Green-Hydrogen-Report-2025.pdf> accessed 20 December 2025.

[186] IRENA, Geopolitics of the Energy Transformation: The Hydrogen Factor' <https://www.irena.org/Digital-Report/Geopolitics-of-the-Energy-Transformation> accessed 17 October 2025.

[187] IEA, Africa Energy Outlook: key findings <https://www.iea.org/reports/africa-energy-outlook-2022/key-findings> accessed 17 October 2025.

[188] To be clear, 'presuming that hydrogen is produced from local, renewable energy resources, it will be a totally green fuel with zero equivalent CO_2 emissions.' See Kari Alanne and Sunliang Cao, 'Zero-energy hydrogen economy (ZEH2E) for buildings and communities including personal mobility' (2017) 71 Renewable and Sustainable Energy Reviews 697, 698.

[189] International Energy Agency (IEA), Global Hydrogen Review 2023 (IEA 2023) 54 <https://www.iea.org/reports/global-hydrogen-review-2023> accessed 13 October 2025.

[190] International Energy Agency (IEA), Global Hydrogen Review 2023 (IEA 2023) 54 <https://www.iea.org/reports/global-hydrogen-review-2023> accessed 13 October 2025.

Many countries in the sub-Saharan Africa have either initiated the projects or are in the process of implementing the programmes within their nation energy strategies. Hydrogen has been found to possess an excellent amount of stored energy, and it is a versatile energy carrier.[191] Thus, hydrogen 'can help tackle various critical energy challenges.'[192] Hence, harnessing this resource, particularly green hydrogen has increasingly been seen by policymakers and climate advocates as a roadmap to reducing the carbon footprint globally. In particular, green hydrogen's growth is seen as a vital part of the global consensus goal of achieving 'net zero' greenhouse gas emissions by 2050.[193]

The exploitation of hydrogen has potential use across multiple sectors including power generation, manufacturing processes in industries such as steelmaking and cement production, fuel cells for electric vehicles, heavy transport such as shipping, green ammonia production for fertilizers, cleaning products, refrigeration, and electricity grid stabilization.[194]

In recent studies, hydrogen has been identified to possess numerous economic benefits such as mitigating climate change catastrophe, reducing greenhouse gases and the CO_2 emissions, increase the electrification rate, as potential alternative for conventional cooking options and diesel generators and eventually creation of wealth and creating job opportunities.[195]

Generally, as earlier argued, there is a clear tendency for policies to be the precursor of institutionalised developmental frameworks regarding energy efficiency and e-mobility. This is essentially the same regarding hydrogen, which is perhaps expected especially considering the small input of clean hydrogen to the global energy mix. For example, 'the market share of [hydrogen fuel cell vehicles] is negligible' and that market is concentrated in a small number of countries.[196] Where any relevant laws exist in the region, they essentially contain tangential, indirect or no references to hydrogen. The overarching need for fuel efficiency may be extended to cover hydrogen, although this may be a strained interpretation in certain cases.[197] In Kenya for example, the Energy Act 2019 contains provisions on hydro-electric generation but those concern rivers.[198]

The development of green hydrogen policies in East Africa is in its preliminary stages, with some countries gaining considerable momentum while others have yet to establish a concrete strategy for hydrogen integration into their energy sectors. This emerging energy frontier presents unique opportunities for the region, particularly given the growing global interest in hydrogen as a key element of the energy transition. Green hydrogen, produced using renewable energy sources such as wind, solar, and hydro, holds immense potential to decarbonise hard-

[191] IEA, 'Hydrogen' <https://www.iea.org/energy-system/low-emission-fuels/hydrogen> accessed 17 October 2025.
[192] ibid.
[193] Hamed Kouchaki-Penchah and others, 'The role of hydrogen in a net-zero emission economy under alternative policy scenarios' (2024) 49 International Journal of Hydrogen Energy 173, 182-185.
[194] International Energy Agency (IEA), The Future of Hydrogen: Seizing the Opportunities (IEA 2019) 11 <https://www.iea.org/reports/the-future-of-hydrogen> accessed 13 October 2025.
[195] Nour AbouSeada and Tarek M Hatem, 'Climate action: Prospects of green hydrogen in Africa' (2022) 8 Energy Reports 3873, 3877.
[196] Ajanovic identified a few countries in this regard: Germany, Japan, China, the United States and South Korea. See Ajanovic (n 161) 4.
[197] In Kenya, neither the Value Added Tax Act of 2022 nor the previous version of 2013 mentions hydrogen or even hydraulic turbines. But cf Green Hydrogen Organisation, 'Kenya' for an analysis of potential and national strategy <https://gh2.org/countries/kenya> accessed 17 October 2025.
[198] Kenyan Energy Act 2019 s 133.

to-abate sectors such as transportation, industry, and power generation.[199] However, the pace and extent of policy development vary across East African nations, with countries like Kenya and Rwanda showing an initiative-taking stance, while others, including Uganda, Tanzania, Burundi, South Sudan, and the Democratic Republic of Congo (DRC), exhibit significant policy gaps.

As shown in Table 3 (*Green hydrogen policy development in East Africa as of 2025*), Kenya stands out as a regional leader in efforts to develop green hydrogen policy. The country's government has made substantial strides in recognising the potential of hydrogen as part of its renewable energy strategy. With the development of a draft policy specifically focused on hydrogen, coupled with the establishment of a dedicated department within the Ministry of Energy, Kenya has laid the foundation for a robust hydrogen ecosystem.[200] This approach indicates a long-term vision, positioning Kenya as a potential hub for hydrogen production and export in East Africa. The 2024 guidelines aim to catalyse green hydrogen projects, safely produce green hydrogen and its derivatives in a way that promotes employment, monitor implementation of green energy products within an effective framework, and facilitate capacity building vis-à-vis research and development.[201] According to the guidelines, 'the production of green hydrogen should be done sustainably to ensure economic, environmental and social benefits and enhance trust and confidence among the players along the value chain.'[202] However, a more deliberate articulation of how to capture economic value could have been set out as this is not explicit in the stated purpose.[203] The guidelines also make a passing but specific reference to 'analytical methods for hydrogen fuel Proton Exchange Membrane (PEM) fuel cell applications for road vehicles.'[204] The draftsperson of the guidelines took the remarkable and pragmatic decision to anchor any complaints or disputes arising from the guidelines to a regulatory framework. Any such complaints or disputes must be referred to the authority designated under the Energy (Complaints and Disputes Resolution) Regulations 2012. However, what seems more realistic is that Kenya has invested in 'the cultivation of regulatory and policy frameworks that will enable and propel green hydrogen endeavours.'[205]

Kenya's proactive steps to foster hydrogen policy come when the country is already recognised as a leader in renewable energy, especially in geothermal, wind, and solar power generation.[206] This renewable energy infrastructure provides an ideal foundation for green hydrogen production. Moreover, Kenya's commitment to a dedicated hydrogen department within its Ministry of Energy is crucial in providing the necessary governance, policy coordination, and oversight required to stimulate investments and foster innovation in the hydrogen sector.

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[199] Qusay Hassan and others, 'Mapping Europe renewable energy landscape: Insights into solar, wind, hydro, and green hydrogen production' (2024) 77 Technology in Society 1.
[200] The Energy and Petroleum Regulatory Authority, *Kenya's Guidelines on Green Hydrogen and its Derivatives* 2024 <https://www.epra.go.ke/sites/default/files/Documents/Guidelines-on-Green-Hydrogen-and-its-Derivatives.pdf> accessed 17 October 2025.
[201] ibid para 1.2.
[202] ibid para 1.4.
[203] Cf ibid para 1.2.
[204] ibid Appendix IV para (d).
[205] Ministry of Energy and Petroleum, Green Hydrogen Strategy and Roadmap for Kenya: <https://www.eeas.europa.eu/sites/default/files/documents/2023/GREEN%20HYDROGEN%20EXEC_0209_0.pdf> accessed 17 October 2025. See the preface by the Principal Secretary (State Department for Energy) p vi.
[206] CSIS, 'Kenya's Green Leadership: Shaping Africa's Climate Future' <https://www.csis.org/analysis/kenyas-green-leadership-shaping-africas-climate-future> accessed 17 October 2025.

The establishment of the hydrogen policy draft also signals Kenya's alignment with global decarbonisation goals, such as the Paris Agreement and the United Nations' Sustainable Development Goals (SDGs). The country's policy vision may attract international partnerships, particularly with nations and companies already engaged in hydrogen technology development. Furthermore, with a clear hydrogen strategy, Kenya can explore the commercialisation of hydrogen through domestic use and export, capitalising on the growing demand for clean energy in Europe, Asia, and beyond.

The successes that Rwanda has achieved regarding the acceleration of renewable energy investments have been attributed to effective laws that support energy generation.[207] Until such laws are put in place, only policies can be assessed but even these have yet to materialise in any clearly articulated manner. While still in the initial stages of hydrogen policy development, Rwanda has also taken important steps toward integrating green hydrogen into its energy agenda. The country has developed a draft policy and established a dedicated department to manage hydrogen energy affairs, mirroring Kenya's approach. This policy initiative is significant, considering Rwanda's commitment to renewable energy expansion, particularly through hydropower and solar energy projects.[208] There is an ambitious target to conduct a feasibility study for hydrogen power plant by 2029/30.[209] A key policy action is to 'pilot Hydrogen to power technology utility scale project.'[210] The Energy Policy also acknowledges 'emerging realities and technology developments such as electric mobility' which need to be factored into the policy development structure.[211] This acknowledgement aligns with earlier arguments made in the context of e-mobility where this article discouraged overregulation.[212] Neither law nor policy should stifle innovation and in this sense the latter (innovation) can stimulate development. Robust legal and policy frameworks are critical to sustainable development.

Rwanda's interest in hydrogen can be understood within the broader context of the country's goal to become a regional technology hub, particularly in energy and climate solutions. A clear hydrogen policy can enable Rwanda to attract investment in hydrogen technology and infrastructure, as well as to explore both local and international hydrogen markets. Given Rwanda's strong environmental focus and willingness to embrace innovative technologies, the country could play a significant role in developing the regional hydrogen value chain, which would provide economic benefits and support sustainable development across East Africa.

Uganda and Tanzania are among the countries that have made significant strides in renewable energy but have yet to establish a clear policy framework or act focused on hydrogen energy. Uganda has several renewable energy policies in place, which have helped to increase its reliance on hydroelectric power and solar energy. The Ugandan government has articulated up to nine strategies that it wishes to achieve. Such strategies include the establishment of

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[207] 'How legislation can help boost renewable energy investments in Africa' https://www.weforum.org/stories/2024/10/legislation-drive-renewable-energy-investments-africa/ accessed 17 October 2025.

[208] Republic of Rwanda Ministry of Infrastructure, *Energy Policy* (Feb 2025 report) <https://www.mininfra.gov.rw/index.php?eID=dumpFile&t=f&f=118271&token=d00c119512f0e0c499d75c71a85026c8e12d11f5> accessed 17 October 2025.

[209] ibid Annex 1 pp 36-37.

[210] ibid.

[211] ibid 5.

[212] Part II of the article on the Energy Trilemma Framework.

'institutional, legal and regulatory framework for the development of green hydrogen.'[213] This strategy articulation places Rwanda on the right trajectory in terms of what needs to be done if there will be sustainable development regarding hydrogen energy. Employing this tripartite approach that clearly promotes a synergy between law and policy is strategic. Complementing this pivotal basis, other strategies include the promotion of private sector investments in green hydrogen development as well as enhancing relevant technical capacity, research and development.[214] These efforts signal a good start in the right direction, but specific policy and legislative framework is important with a view to ensuring legal certainty.

Tanzania is in a largely similar position as Rwanda as there is no clear legislative or policy framework on hydrogen energy. Although Tanzania has abundant renewable resources, such as hydropower and solar, the absence of a strategic hydrogen policy hampers its ability to tap into global hydrogen markets in a systematic and deliberate way that will promote sustainable development. Admittedly, this does not stop exploratory efforts such as memoranda of understanding.[215] However, any development short of dedicated legislative and policy framework will undermine development. Such a framework will foster domestic production, as well as attract investment and technology transfer from international players in the hydrogen sector.[216]

Burundi and South Sudan face even more significant challenges regarding green hydrogen policy development. For example, Burundi has a particularly low access rate despite its vast renewable energy potential especially hydro, solar and wind.[217] The lack of a hydrogen policy suggests a missed opportunity to capitalise on these resources for green hydrogen production. South Sudan does not fare much better in terms of energy access.[218] South Sudan, which has struggled with political instability, must first prioritise the development of a stable governance framework for energy and infrastructure before hydrogen can be seriously considered. But the dire need for energy access implies that South Sudan should prioritise the development of diverse energy resources in future development plans.[219] Hydrogen can fit into any such plans. Both Burundi and South Sudan lack any clear laws or policies regarding hydrogen energy, which severely limits their ability to pursue hydrogen as part of their energy strategy. Without a dedicated legal framework, it is difficult to establish the regulatory environment necessary for investments in hydrogen infrastructure and technology. Nevertheless, both nations would

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[213] Ministry of Energy and Mineral Development, Energy Policy for Uganda 2023: <https://www.globalrightsalert.org/sites/default/files/2024-02/Energy%20Policy%20for%20Uganda%202023-14082023docx_230911_114502%20%281%29.pdf> (66-67) accessed 17 October 2025.
[214] ibid 66.
[215] Zero Emissions Ship Technology Association, 'ZESTAs and TEEMO Sign Landmark MOU to Advance Green Hydrogen Shipping Fuel and Capacity Building in Tanzania' <https://www.industryevents.com/events/zestas-and-teemo-sign-landmark-mou-to-advance-green-hydrogen-shipping-fuel-and-capacity-building-in-tanzania> accessed 17 October 2025.
[216] Shree Om Bade and Olusegun Stanley Tomomewo, 'A review of governance strategies, policy measures, and regulatory framework for hydrogen energy in the United States' (2024) 78 International Journal of Hydrogen Energy 1363.
[217] Africa Energy Portal <https://africa-energy-portal.org/aep/country/burundi> accessed 17 October 2025.
[218] Cf Sudan where the need to meet increasing energy demands and decrease the use of fossil fuels has place renewable energy at the core of Sudan's renewable energy strategy. Even so, there is a need to create supportive legal frameworks. See Ihab Jabbar Al-Rikabi, 'Renewable Energy in Sudan: Current Status and Future Prospects' (2025) 7(1) Engineering Reports 1, 21-22.
[219] Aban Ayik and Nelson Ijumba, 'Renewable Energy: A Way Out for South Sudan's Electricity Crisis' (2024) F1000 Research 1, 9.

benefit from the development of green hydrogen policies that could not only provide domestic energy solutions but also enhance regional energy cooperation.

The Democratic Republic of Congo (DRC), one of the most resource-rich countries in the world,[220] is another key player in the regional green hydrogen landscape. Despite its vast renewable energy potential, primarily through hydropower from the Congo River and vast solar resources, the DRC has yet to develop a clear policy, legal or regulatory framework for hydrogen energy. This absence of policy and strategic focus is a critical gap, especially given the country's substantial renewable energy capacity.

Table 3: Green hydrogen policy development in East Africa as of 2025[221]

Country	**Status of Policy development**
Kenya	Policy adopted and a dedicated department on hydrogen created within the Ministry of Energy.
Uganda	Several renewable energy policies but no clear legal or policy framework on hydrogen energy strategy.
Tanzania	At early stages of developing policy framework on hydrogen energy strategy.[222]
Rwanda	Included in the 2025 national energy policy developed and a dedicated department on hydrogen[223]
Burundi	No clear legal or policy framework on hydrogen energy strategy.
South Sudan	No clear legal or policy framework on hydrogen energy strategy.
Democratic Republic of Congo (DRC)	Lack of green hydrogen policy.
Somalia	No clear legal or policy framework on hydrogen energy strategy.

The DRC's lack of a green hydrogen policy and legal frameworks, despite its potential to become a regional leader in clean energy, places it at a disadvantage. The DRC could benefit significantly from integrating green hydrogen into its energy strategy, particularly given the growing demand for clean energy in Africa and globally. Developing a policy framework for hydrogen energy could unlock investments in hydrogen production, enhance the DRC's energy security, and facilitate its participation in international green hydrogen markets.

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[220] GlobalEDGE, 'Democratic Republic of the Congo: Economy' <https://globaledge.msu.edu/countries/democratic-republic-of-the-congo/economy> accessed 6 January 2026

[221] Theoneste Uhrorakeye and others, *African Green Hydrogen Report Potential to Power: Advancing Green Hydrogen Across Africa* (2025) <https://ptx-hub.org/wp-content/uploads/2025/06/African-Green-Hydrogen-Report-2025.pdf?utm_source=www.hydrogen-rising.com&utm_medium=referral&utm_campaign=africa-s-hydrogen-execution-gap-set-to-start-closing-by-2026> accessed 6 January 2026. See also Energy Regulatory Association of East Africa, The Electricity & Renewable Energy Portfolio Committee (2024 Report) <https://energyregulators.org/wp-content/uploads/2026/01/EREPC-Report-_-June-2024.pdf> accessed on 6 January 2026.

[222] Energy Regulatory Association of East Africa, *Electricity & Renewable Energy Portfolio Committee Report of December 2024* <https://energyregulators.org/wp-content/uploads/2026/01/EREPC-Report-_-December-2024.pdf> accessed 6 January 2026.

[223] Rwanda Energy Policy (2025) <https://www.mininfra.gov.rw/index.php?eID=dumpFile&t=f&f=118271&token=d00c119512f0e0c499d75c71a85026c8e12d11f5#:~:text=Policy%20Actions%3A%20The%20Rwanda%20Energy,the%20implementation%20of%20existing%20sub%2D&text=and%20%7CImportation%20of%20fuel%20in,requirements%20and%20licence%20conditions%20for> accessed 2 January 2025.

Across East Africa, the future of green hydrogen lies in the ability of individual nations to create coherent, comprehensive policies that enable the development of this emerging energy sector.[224] While Kenya and Rwanda have taken positive steps toward integrating green hydrogen into their energy portfolios, countries like Uganda, Tanzania, Burundi, South Sudan, and the DRC must move quickly to develop the necessary policy frameworks. This will be essential not only for national energy security but also for positioning the region as a key player in the global hydrogen economy. The creation of clear hydrogen strategies will open doors for international collaboration, investment, and technology transfer, and can drive both regional economic development and global energy transition goals. As the world moves towards sustainable energy, East Africa could leverage its renewable resources to become a global leader in green hydrogen, provided it acts decisively to close existing policy gaps.

Countries need to develop comprehensive hydrogen strategies, particularly considering the regional and global transitions towards clean energy. A robust hydrogen framework could help Uganda and Tanzania diversify their energy mix, enhance energy security, and provide new economic opportunities in the growing green hydrogen market.[225]

A regional approach to promoting Africa's green hydrogen development is important. Apart from any legislative, regulatory or policy frameworks that may be developed on a regional level, the unique nature of hydrogen energy in terms its production and deployment require complimentary collaborative efforts at other levels. An example is the African Hydrogen Partnership which is 'solely dedicated to the development of green and natural (native) hydrogen, hydrogen-based chemicals, fuel cell technology and related business opportunities in Africa.'[226] Such a forum is strategic for the East Africa Hydrogen Corridor.[227] A regional approach to renewable energy should go beyond green hydrogen energy.

V. A Regional Approach to Policy and Legal Frameworks

Failing to develop effective policy and legal frameworks will be out of step with a holistic and robust approach to an inclusive and just energy transition. Efforts 'to achieve more equitable distribution of costs within the wider climate change goals' requires careful consideration of procedural justice, distributive justice and restorative justice.[228] Appropriate synergy between effective laws and policies is critical to attaining justice as the latter must be based on legal certainty and determinable framework. Long-term successful climate action requires careful deployment of clean energy. Effective legislative and policy frameworks are necessary for successful climate action and clean energy to thrive. This holistic approach is a practical way to consider and underscore the need for regional cooperation.

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[224] H2Global, Insights from an innovative country clustering analysis (June 2025) <https://h2-global.org/wp-content/uploads/2025/06/H2Global-White-paper-Country-Clustering-FINAL.pdf> accessed 13 October 2025.
[225] ibid.
[226] African Hydrogen Partnership, 'Empowering Sustainable Economies' <https://ahp.africa/> accessed 17 October 2025.
[227] Toby Greenbury and others, 'The East Africa Hydrogen Corridor' <https://hydrogen.revolve.media/2022/features/africa/#:~:text=Once%20green%20hydrogen%20can%20be,transportation%20internationally%20and%20within%20Africa> accessed 17 October 2025.
[228] African Development Bank and Climate Investment Funds, *Just Transition in a Renewable Energy Riche Environment: Potential Role of Green Hydrogen* 58-59. <https://www.afdb.org/sites/default/files/documents/publications/20102022_potential_role_of_green_hydrogen_003.pdf> accessed 17 October 2025. This report involved case studies (Kenya was one of the countries) with a positive assessment of clean energy production potential including hydrogen energy.

East African countries have demonstrated the capacity to collaborate in the field of energy (and other areas that have socio-economic implications) within a context of solid legislative and policy frameworks. For example, the scope of cooperation under the Protocol for Sustainable Development of Lake Basin 2003 includes the promotion of development of infrastructure and energy.[229] However, the region has yet to articulate any systematic way of adopting a cross-border approach to developing relevant frameworks that will enhance clean and efficient energy. There is scope for East African countries to build on relevant provisions of the Treaty establishing the East Africa Community. The Treaty provides that 'the Partner States shall adopt policies and mechanisms to promote the efficient exploitation, development, joint research and utilisation of various energy resources available within the region.'[230] The Treaty also envisages the 'utilisation of new and renewable energy sources'[231] and enabled 'all such other measures to supply affordable energy to their people taking cognisance of the protection of the environment'.[232] These are remarkable provisions considering that they entered into force as far back as July 2000.[233] There is, however, a significant gap regarding how the region is taking advantage of such provisions that can promote sustainable development in a proactive manner.

It is rather inevitable that the East African Court of Justice will be increasingly involved in issues that concern energy and environment related issues.[234] National judgments, to varying degrees, contain direct or indirect indicators with respect to renewable energy and considering the 'increasing push toward transitioning to cleaner energy sources' globally.[235] A proactive and collaborative approach to energy efficiency and clean energy in the region will make it easier to benefit from a harmonised approach to resolving inevitable disputes that arise from clean energy activities. In other words, the EAC Court can then complete or at least complement legal and policy frameworks that support domestic and cross-border activities

[229] E.g., Protocol for Sustainable Development of Lake Basin of 29 November 2003. Kenya, Uganda, and Tanzania signed the Protocol.
[230] Treaty Establishing the East African Community 1999 Art 101(1).
[231] ibid art 101(2)(a).
[232] ibid art 101(1)(f).
[233] Entered into force on 7th July 2000 (Amended on 14th December, 2006 and on 20th August, 2007) <https://repository.eac.int/items/9b0725a1-1940-45ea-9e6d-e1ca0f4bf6f7> accessed 20 December 2025.
[234] E.g., See the ruling of the East African Court of Justice (First Instance Division) in *Centre for Food and Adequate Living Rights v Attorney General of the Republic of Uganda* (Reference No. 39 of 2021). This case concerned human rights protections and disregard of environmental considerations. Crucially it also involved a consideration of relevant EAC Treaty provisions and the Lake Victoria Basin Protocol.
[235] In Kenya, see: *Hamisi v National Environment Management Authority* [2024] KENET 925 (KLR) 1. See also *Ermer Limited v Commissioner of Customs & Border Control* [2023] KETAT 302 (KLR) (Civ) para 11; *Kochale v Lake Turkana Wind Power Ltd* [2022] eKLR para 5; on the enforcement of a foreign arbitration award, see the Ruling of the High Court of Uganda [2024] UGCommC 75 paras and 2 and 98 regarding *Great Lakes Energy Company v MSS Xsabo Power Ltd* LCIA Case No. 204602.

concerning clean energy. This benefit, as this article suggests, will be maximised through a strategic combination of 'inside out'[236] and 'outside in'[237] strategies.[238]

First, based on an 'inside out' strategy, EAC countries should develop legislative and policy frameworks *that provide mechanisms which can facilitate regional cooperation*. One of this article's key proactive contributions therefore goes beyond merely combining both strategies. Genuine regional cooperation cannot be foisted on Partner States of the EAC. This is already evident in the significant, sometimes vast, discrepancies in national approaches to energy related issues raised in this article. The EAC Treaty appears to focus more on integration which accounts for why 'integration' appears about four times more than 'cooperation' in the EAC Treaty. To illustrate, one of the few provisions where cooperation is specifically mentioned concerns management of the environment. For the purposes of Article 111 (on environmental issues and natural resources), Partner States undertake to cooperate in developing 'special environmental management strategies to manage fragile ecosystems, terrestrial and marine resources, noxious emissions and toxic and hazardous chemicals'.[239] This illustration is relevant because of the relationship between clean energy and the environment. One interpretation could be that cooperation essentially focuses on developing national policies in that regard. But even this interpretation allows scope for individual Partner States to coordinate ideas that should drive such national strategies. Regarding energy specifically, the Treaty provides that the Partner States shall adopt policies and mechanisms to promote the efficient and utilisation of energy resources as stated earlier.[240] As argued in the context of environmental management, there should be a coordination of overarching ideas. Doing this properly should then feed into the development of similar overarching idea-based policy and legal frameworks even if there may be differences in certain detail taking specific national contexts into account. This is compatible with 'the principle of variable geometry which allows for progression in cooperation among groups within the Community for wider integration.'[241]

Second, an 'outside in' strategy should focus on developing relevant regional frameworks that can influence and drive EAC countries to adopt a harmonised approach to clean energy issues. Using the illustration of environmental management again, in pursuance of Article 111 of the Treaty, Partner States 'undertake to cooperate in the management of the environment and agree' to develop 'a common environmental management policy' that would sustain their ecosystems.[242] A narrow interpretation would restrict such common policy to environmental management although as argued earlier, clean energy cannot be divorced from environmental issues. While any such narrow approach would be unhelpful ultimately, the EAC legislator

[236] Some legal scholars have used the term 'inside-out' is sometimes used but mostly in dispute resolution and professional issues. A more relevant use of the was in the context of legal theory considering law (and philosophy) on the one hand; and social and natural sciences. In this regard, it was argued that 'the internal/external distinction has outlived its utility.' See Charles L Barzun, 'Inside-Out: Beyond the Internal/External Distinction in Legal Scholarship' (2015) 101(5) Virginia Law Review 1205, 1285. Otherwise, this article uses 'inside-out' in a very different sense with respect to a synergy between domestic ('inside') and international ('outside') law.

[237] In advocating an 'outside in' approach regarding U.S. relations law, Scoville argued that Americans should recognise 'the importance of the global epistemic environment in which U.S. foreign relations law operates, by developing meta-knowledge of this field, and by using that knowledge to improve the law's design and implementation.' See Ryan M Scoville, 'U.S. Foreign Relations Law from the Outside In' (2022) 47 Yale Journal of International Law 1, 6.

[238] Scoville rightly argued that an 'inside-out orientation serves important purposes, but it is incomplete'. See Scoville ibid 74.

[239] EAC Treaty, art 112(1)(b).

[240] ibid art 101(1).

[241] ibid art 7(1)(e).

[242] ibid art 112(1)(a).

arguably refrained from using specific wording that would compel a strictly common approach to energy. 'Partner States shall adopt policies and mechanisms' to promote efficient energy utilisation.[243] One way of doing that is to require Partner States to *promote* 'the least cost development and transmission of electric power, efficient exploration and exploitation of fossil fuels and utilisation of new and renewable energy sources.'[244] Thus, although there seems to be no clear obligation to 'adopt policies' laid down at the EAC level regarding energy efficiency generally, a purposive and holistic reading of the Treaty indicates the need for genuine cooperation between Partner States if the ends of integration are to be attained. In allowing for 'progression in cooperation among groups within the Community' the principle of variable geometry does so with a view to attaining 'wider integration schemes in various fields and at different speeds.'[245] Cooperation is therefore critical to effectuate the principle of variable geometry – one of the 'operational principles of the Community'.[246]

Both strategies will align with the key argument of this article that there should be a strategic synergy between policies and laws regarding clean energy and a just transition driven by inclusivity. Both 'inside out' and 'outside in' strategies can also avoid any adverse overlaps or conflation between regional cooperation and regional integration. Under regional cooperation, national identities can be maintained while working together to address common challenges.[247] This regional cooperation approach seems to represent the reality concerning renewable energy in the EAC. From a policy and legal framework perspective, such regional cooperation approach should not impede development especially as the Treaty does not require cooperation just for the sake of cooperation. Combining 'inside out' and 'outside in' strategies will also fit into and thrive within a variable geometry system. The EAC Treaty provides 'the principle of variable geometry which allows for progression in cooperation among groups within the Community for wider integration schemes in various fields and at different speeds.'[248] The flexibility that underpins this principle makes it attractive as a mechanism to promote development in a fair manner that factors in individual challenges of Partner States. However, the principle may lead to 'fragmentation of the integration bloc' when used under political influence.[249] This is especially because Partner States can exploit the principle to avoid regional developmental decisions or roadmaps.[250] Fragmentation can also extend to policies and laws in a way that causes contradictions and ultimately undermines sustainable development in the region. This is where combining the 'inside out' and 'outside in' strategies can mitigate the weaknesses of the variable geometry principle on at least two levels. First, this combination drives harmonisation in a way that prevents or minimises any excuses for not developing policy and legal frameworks. Progress can be made nationally or regionally and even in any order from the standpoint of establishing relevant frameworks. National and regional approaches can also take place concurrently. Second, the combination of 'inside-out' and 'outside in' strategies

[243] ibid art 101(1).
[244] ibid art 101(2)(a).
[245] ibid art 7(1)(e).
[246] ibid.
[247] The 're-centring of national political centres to broader institutional platforms of states' does not quite represent the reality in the context of renewable energy in the EAC region. On the difference between regional cooperation and integration, see Chukwuka G Monyei and others, 'Regional cooperation for mitigating energy poverty in Sub-Saharan Africa: A Context-based approach through the tripartite lenses of access, sufficiency, and mobility' (2022) 159 Renewable and Sustainable Energy Reviews 1, 9.
[248] The EAC Treaty, art 7(1)(e).
[249] Khoti Chilomba Kamanga and Ally Possi, 'General Principles Governing EAC Integration' in Emmanuel Ugirashebuja and others, *East African Community: Institutional, Substantive and Comparative EU Aspects* (Brill Nijhoff, 2017) 202, 209.
[250] ibid 209.

is relatively inexpensive as it is cheaper to develop policy and legal frameworks nationally or regionally than immediately to provide relevant infrastructure for a robust approach to clean energy. The East African Court of Justice has demonstrated the capacity to accommodate and promote the arguments in this article. For example, in considering consensus in decision making and variable geometry, the Court observed that 'consensus is fine at policy level.'[251] This is strategic foundation on which legislative framework can be built. In this way, the 'inside out' and 'outside-in' strategies can be used to maximise complementarity between policy and law.

Both strategies, especially the 'outside in' strategy, can thrive through the effective use of the Eastern Africa Power Pool. The vision for the Pool to transform the region (from the standpoint of reliable, affordable and sustainable energy) should support the coordination of national energy policy frameworks. The most advanced African power pools[252] are typically designed considering physical, institutional, economic and political factors which are relevant at the operational level.[253] This largely political economy context will mitigate any deficiencies that may exist in overarching legal or policy frameworks. As a form of economic integration,[254] such advanced pools can also support the development of strategic interconnections between African regions.[255]

VI. Conclusion

The energy transition in East Africa is characterised by an intricate interplay of challenges and opportunities. There are clear economic and commercial implications from the standpoints of needs and potential benefits which overarch this article. Kenya's exemplary leadership in geothermal energy and its progressive adoption of wind and solar energy highlight the region's potential for diversification and innovation. However, the evident inadequacy of policy and legal frameworks underscores an urgent need for cohesive frameworks and regional collaboration. Infrastructural disparities across the EAC compound the inadequacy of such frameworks, but such disparities are also because of inadequate, incoherent or even non-existent frameworks especially at the regional level.

This article addresses these gaps by suggesting novel and systematic ways of addressing two key needs. One key need is the provision of modernised infrastructure. It is essential to promote deliberate investments in advancing energy storage technologies and fostering localised renewable energy projects. Countries like Rwanda and Kenya provide scalable models, particularly in leveraging incentives such as subsidies and tax relief to catalyse private-sector engagement. Emerging technologies—notably green hydrogen and electric mobility—represent transformative avenues for aligning regional energy strategies with global

[251] See the advisory opinion of the Court in the *Matter of a Request by the Council of Ministers of the East African Community* (Application No. 1 of 2008) 1, 45 (East Africa Court of Justice (First Instance Division).
[252] Others are the pools in Southern and Western Africa. See Mohamed A Eltahir Elabbas, Laurens de Vries and Aad Correljé, 'African power pools and regional electricity power design: Taking stock of regional integration in energy sectors' (2023) 105 Energy Research and Social Science 1.
[253] ibid.
[254] ibid 13.
[255] E.g., the '€268 million project of a 620 km interconnector will last five years (2025-2030) and will connect Southern and Eastern Africa's power pools to enable cross-border energy trade, expand transmission capacity, and strengthen reliable power supply in Northern Zambia.' See Directorate-General for International Partnerships (European Commission), Global Gateway to scale up energy security in Southern and Eastern Africa 11 April 2025 <https://international-partnerships.ec.europa.eu/news-and-events/news/global-gateway-scale-energy-security-southern-and-eastern-africa-2025-04-11_en> accessed 31 March 2026.

decarbonisation imperatives. Some African countries such as Kenya have demonstrated clear leadership potential within and even outside the East African region.[256] Kenya and Rwanda highlight the practicality of integrating robust energy policies and strategic incentives. Generally, however, other countries grapple with infrastructural deficiencies, regulatory fragmentation, and inadequate investment flows. Successful collaborative regional approach in East Africa is essential to tap into, optimise and even possibly drive any wider collaboration regarding clean energy on the African continent.

Effective policy and legal frameworks are critical to providing relevant infrastructure in any systematic or sustained manner. An inside-out and outside-in approach, as this article espouses, will ensure that individual countries develop laws, regulations and policies which incorporate mechanisms that enable and facilitate regional cooperation. There is ample scope to predicate this approach on relevant provisions of the Treaty for the Establishment of the EAC. The variable geometry principle also accommodates and supports the thesis of this article. This principle provides fertile ground for streamlining progress concurrently in individual Partner States and regional cases as it can be done subject to relevant socio-economic contextualisation. For example, trying to achieve energy efficiency and energy competitive abundance can progress concurrently. The 'inside out' and 'outside in' layers of international cooperation can facilitate an inclusive approach to renewable energy which is needed across the EAC. These strategies should contribute to effectuating the Energy Trilemma in a practical and contextual way, thereby contributing uniquely to comparative EAC literature.

Another key need is international cooperation in a way that is compatible with the variable geometry principle enshrined in the Treaty for the Establishment of the EAC. Regional integration, spearheaded by relevant institutions such as the Energy Regulators Association of East Africa and East African Centre of Excellence for Renewable Energy and Efficiency, is indispensable for optimising shared resources, harmonising regulatory landscapes, and enhancing energy system interoperability. Such institutions are key because they came into existence outside a national or sovereign framework which places them in a unique position to identify, address and promote ways to galvanise non-State actors in a way that develops clean energy. Crucially, the East Africa Power Pool has the potential to promote and help to coordinate regional cooperation in a pragmatic manner that mitigates short-term system deficiencies.

These suggestions are compatible with the variable geometry principle. To illustrate, this article argues against overregulation in any way that might impede innovation or complex and audacious enterprise regarding renewable energy via-à-vis energy efficiency.[257] States can benefit from the interdependence that their strengths and deficiencies foster, thereby allowing frontrunner States to further develop while supporting States that lag on their developmental trajectory. Partnerships between the public and private sectors are critical to attaining sustainable development. East Africa should be well positioned to spearhead a sustainable energy future by proactively addressing legal, regulatory and infrastructural impediments. This regional approach, underpinned by systematic cooperation, will enhance economic resilience across the African continent and make substantive contributions to global climate ambition.

[256] In 2022, Kenya joined South Africa, Namibia, Egypt, Morocco and Mauritania to form a hydrogen alliance. See Africa Energy Portal, 'Six countries join forces to launch African Green Hydrogen Alliances' <https://africa-energy-portal.org/news/six-countries-join-forces-launch-africa-green-hydrogen-alliances> accessed 17 October 2025.

[257] Part II of this article on the energy trilemma framework.