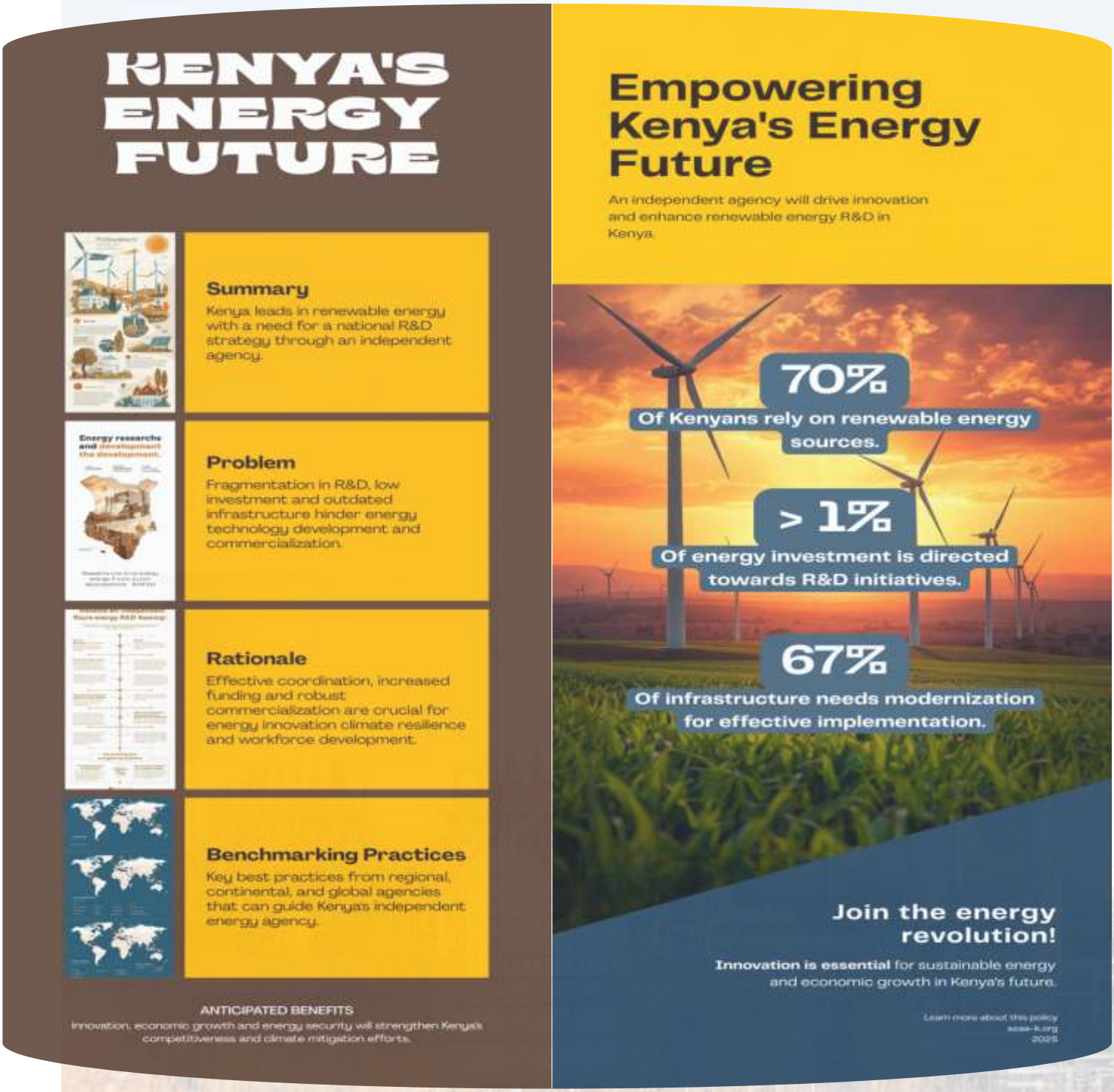
SEAA-K
Sustainable Energy Access Association of Kenya

POLICY BRIEF

INSTITUTIONALIZATION OF AN INDEPENDENT ENERGY RESEARCH AND DEVELOPMENT AGENCY

Key Insights
Empowering Kenya's energy landscape through innovation and research.



CONTENTS

EXECUTIVE SUMMARY

Kenya's energy sector is at a pivotal crossroads, marked by rapidly growing energy demands, vast untapped renewable energy potential. Energy is a key enabler for realizing Kenya's vision to transform into an industrializing middle-income country. Kenya has emerged as a regional leader in renewable energy, with more than 90% of its energy derived from green sources. This impressive achievement aligns with national and global sustainability goals, including the Paris Agreement and Sustainable Development Goal 7 (Affordable and Clean Energy).

However, despite the notable progress in expanding access to energy and developing clean energy infrastructure, the country faces persistent structural and technical challenges that hinder the full realization of its energy potential. As a country, we must develop and implement a national research and development strategy for the energy sector.

This policy brief proposes the institutionalization of an independent energy research and development agency to serve as a central coordinating body for energy-related research, innovation and technology development in Kenya. This will remedy the persistent challenges faced and translate scientific findings into scalable, context-relevant energy solutions.

This policy brief calls upon government, development partners, academia and the private sector to support the creation of a robust, well-resourced and independent energy research and development agency as a critical lever for national development.

PROBLEM STATEMENT

The Energy Act (2019) assigns the responsibility for energy research and development (R&D) to the Nuclear Power and Energy Agency (NuPEA). However, NuPEA's core mandate is focused on nuclear energy planning and development. This creates a research and development fragmentation within the multiple energy entities in Kenya. Therefore, there is an urgency to institutionalize an independent energy research and development agency that coordinates r&d across Kenya's diverse energy ecosystem.

Consequently, this fragmented approach has resulted in:

- Research efforts are duplicated and siloed across different academia, think tanks and private sector players.
- Policy formulation lacks timely and reliable scientific input.
- Investment in energy research and development remain low (well below 1% of GDP).
- Indigenous solutions for local energy challenges are underdeveloped.
- Outdated and fragmented grid infrastructure complicates the integration of decentralized energy systems and smart grid technologies.
- Weak local technology development has led to continued reliance on imported energy solutions, missing opportunities for domestic industrialization and job creation.
- Limited energy storage capacity hampers the reliability and flexibility of power supply, especially from intermittent sources like wind and solar.
- Commercialization pathways – this means that many promising ideas and prototypes never reach the market or scale.

RATIONALE FOR INSTITUTIONALIZATION OF AN INDEPENDENT ENERGY RESEARCH AND DEVELOPMENT AGENCY

Establishing an independent, centralized Energy Research and Development Agency would address these gaps by acting as a national hub for coordinated research. It would also serve as a platform to mobilize and manage funding, build cross-sectoral partnerships and ensure that research outputs align with Kenya's strategic development. This proposed Agency would enable Kenya to remain competitive in a rapidly evolving global energy landscape.

The proposed Agency would have a mandate to:

1. **Enhance Coordination** – Streamlining fragmented research efforts across universities, government bodies and private sector players to avoid duplication and maximize impact. It will facilitate coordinated national energy research aligned with development goals.

2. **Increase Funding & Investment** – Attract domestic and international research and development funding, climate finance, venture capital and public-private partnerships. Fund and incubate cutting-edge innovations particularly in renewable energy and energy efficiency.

3. **Technology Commercialization** – Bridging the gap between research and market deployment by supporting pilot projects, startups and scalable energy solutions. Build capacity through collaborative partnerships with industry players, and international research networks.

4. **Policy & Regulatory Support** – Providing evidence-based insights to inform energy policies, standards and regulatory frameworks for government bodies and stakeholders.

5. **Workforce Development** – Strengthening local expertise through capacity-building programs and partnerships with various institutions. Reduce import dependency and create green jobs.

6. **Climate Resilience & Energy Transition** – Accelerating the shift to renewable energy, energy efficiency and emerging technologies (e.g., green hydrogen, battery storage, smart grids) to meet Kenya's net-zero targets.

CASE STUDY: BENCHMARKING GLOBAL BEST PRACTICES

1. Regional (East Africa)
   - ❖ **Energy Resources and Energy Efficiency Research Centre (EREE-RC)**

Part of the Kenya Industrial Research and Development Institute (KIRDI), this department do research on renewable energy, energy efficiency, biomass utilization, cookstove design, biogas technologies, and energy audits. It hosts several ISO-accredited labs for biogas, cookstoves, and energy efficiency testing.

   - ❖ **Environmental Sustainability and Climate Change Research Centre (ESCC-RC)**

Also, under KIRDI, ESCC-RC focuses on cleaner production methods, resource-use efficiency, industrial symbiosis and climate change adaptation.

   - ❖ **Geothermal Development Company (GDC)**

A government-owned entity mandated to explore and develop Kenya's geothermal resources. Its work is heavily research-informed regarding resource identification and drilling technologies.

2. Continental (Africa)
   - ❖ **South African National Energy Development Institute SANEDI (South Africa)**

It was established under the National Energy Act No. 34 of 2008. SANEDI's core mission is to drive innovation in clean energy and support South Africa's transition to a low-carbon future.

   - ❖ **IRESEN (Morocco)**

The Institute for Research in Solar Energy and New Energies (IRESEN) was created in 2011 at the initiative of the Ministry of Energy, Mines and the Environment in order to support the national energy strategy through research as well as innovation in the field of green technologies.

3. Global
   - ❖ **ERDA (United States of America)**

The U.S. Energy Reorganization Act of 1974 replaced the Atomic Energy Commission (AEC) with three different and distinct bodies:

- **Energy Research and Development Administration (ERDA)**: Spearheaded R&D for nuclear and alternative energy.
- **Nuclear Regulatory Commission**: Ensured nuclear safety.
- **Energy Resources Council**: Coordinated federal energy policies.

POLICY AND LEGAL FRAMEWORK

For Kenya to establish a functional and sustainable Independent Energy Research and Development (R&D) Agency, a robust policy and legal framework must be developed. This framework should ensure autonomy, funding stability, regulatory clarity and alignment with national development goals. Below is a structured analysis of the necessary legal and policy mechanisms.

Introduce Primary Legislation:

Energy R&D Act - A dedicated Energy Research and Development Act should be enacted to:

- Establish the agency as a statutory body (similar to KENGEN, EPRA or KIRDI).
- Define its mandate, governance structure, and operational autonomy.
- Provide legal authority to enter partnerships, own IP and receive funding.
- Ensure independence from political interference while maintaining accountability.

Amendments to Existing Laws

Key laws requiring alignment:

1. Energy Act (2019) – Recognize the R&D agency as a critical player in energy innovation.
2. Science, Technology, and Innovation (ST&I) Act (2013) – Integrate energy R&D into national research priorities.
3. Public Finance Management (PFM) Act – Allow flexible funding mechanisms (e.g. revolving funds, multi-year budgeting).
4. Climate Change Act (2016) – Align energy R&D with Kenya's climate mitigation goals.

ANTICIPATED BENEFITS AND IMPACTS

The institutionalization of an Independent Energy Research and Development (R&D) Agency in Kenya could bring significant benefits and transformative impacts to the country's energy sector and the economy as a whole. The following are the anticipated benefits and potential impacts:

- **Accelerated Energy Innovation and Technological Advancement**

The agency will focus on cutting-edge research which can lead to breakthroughs in renewable energy technologies, energy storage and smart grids that can transform the energy landscape.

- **Economic Growth and Job Creation**

This can spur local manufacturing of energy appliances and other energy technologies thus reducing import reliance which will create jobs for engineers, scientists and technicians fostering a knowledge-based economy.

- **Energy Security and Affordability**

Breakthroughs in renewable energy and storage could lower electricity prices for households and industries. Reduced reliance on hydropower (vulnerable to droughts) and imported fuels enhances resilience. Innovative off-grid and micro grid solutions could expand energy access to underserved regions.

- **Climate Change Mitigation and Environmental Benefits**

Advancements in clean energy will reduce greenhouse gas emissions. Research into cleaner cooking technologies (e.g., biogas, ethanol stoves) can curb deforestation and indoor air pollution.

- **Strengthened Policy and Regulatory Frameworks**

The agency could provide data-driven insights to guide energy regulations, subsidies and incentives. A clear mandate, transparent research processes and regular reporting can help ensure the agency is held accountable for its work and the effective use of funds.

- **Global Competitiveness and Investment Attraction**

A specialized R&D agency could position Kenya as an Energy Research Hub and a leader in Africa's energy innovation landscape. In return investors and donors may fund potential energy projects developed by the agency.

- **Capacity Building and Knowledge Transfer**

Partnerships with universities could attract expertise and strengthen engineering and energy research programs. Collaboration with global institutions could facilitate access to cutting-edge energy technologies.

KEY RECOMMENDATIONS

1. **Define Clear Goals and Objectives**: Establish a clear and enduring mission for the Research and Development (R&D) agency to guide its long-term goals and research agenda.
2. **Set specific objectives:** Align the agency's focus with national energy policies to give direction to research efforts such as Kenya's National Energy Policy 2025-2034, which emphasizes on renewable energy, clean cooking and energy efficiency.
3. **Consider the long-term vision**: Expect significant development time (potentially decades) for R&D goals and plan for flexibility to adapt to changing objectives and energy sector environment.
4. **Policy and Legislative Action**: The Government of Kenya should pass a Cabinet memo and subsequently a bill in Parliament to amend the Energy Act 2019 to establish the Independent Energy Research and Development Agency.
5. **Capacity Building**: Focus on building a highly talented, diverse and skilled workforce for the Energy Research and Development (R&D) industry. Invest in local laboratories and energy data infrastructure.
6. **Institutional and Stakeholder Engagement**: Convene national consultations with energy stakeholders to co-design the institutional framework.
7. **Energy Market Analysis**: Delve into the sustainable and renewable energy market to keep pace with evolving energy trends and energy innovations.

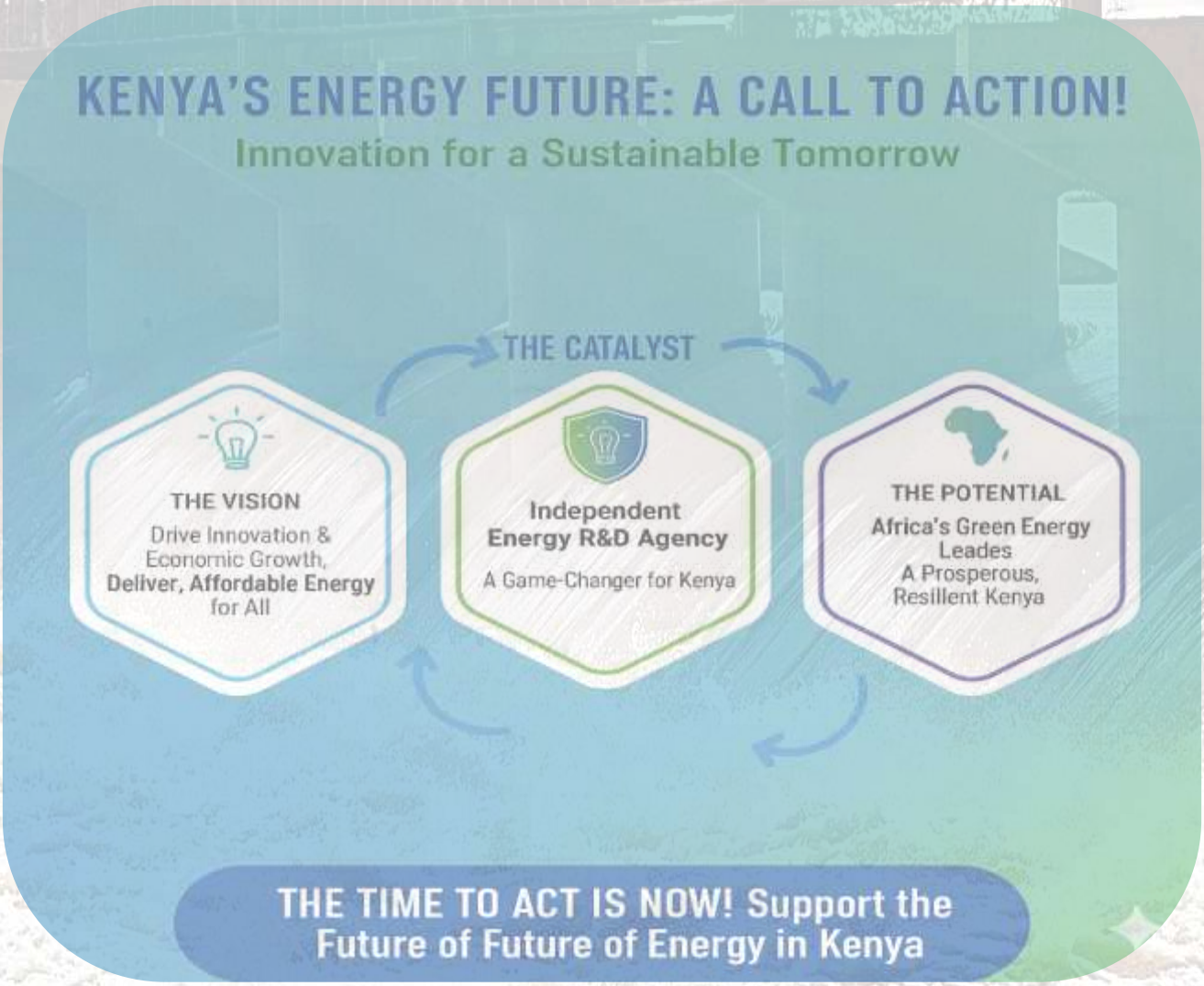
CONCLUSION

Kenya's energy future hinges on innovation. An independent energy R&D agency could be a game-changer in driving innovation, economic growth and deliver clean, affordable, reliable and sustainable energy for all. By focusing on local energy challenges while leveraging global best practices, Kenya could transition into a green energy leader in Africa. This brief provides an actionable, Kenya-focused roadmap to position the country as Africa's energy innovation hub.

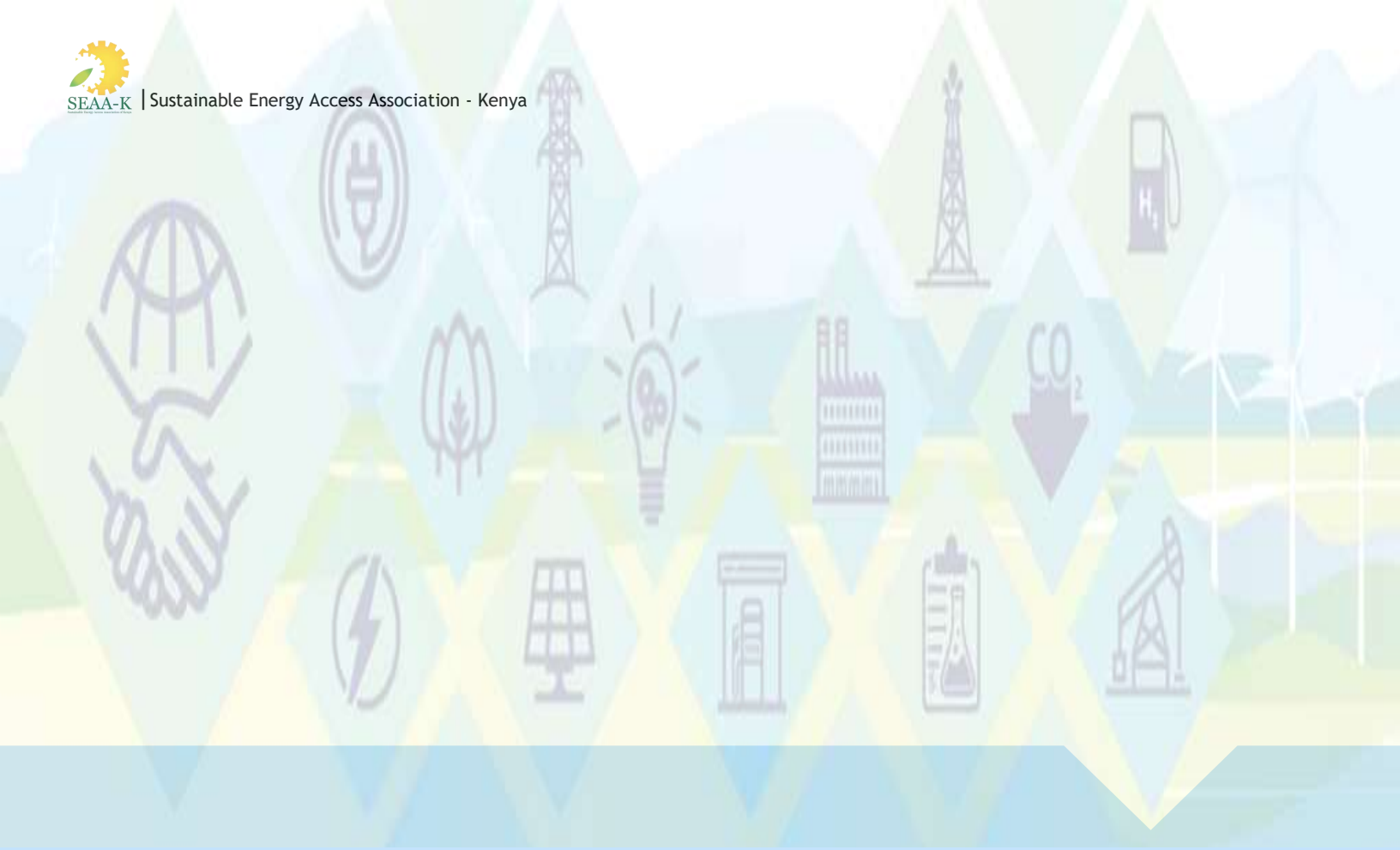
The time to act is now.

REFERENCES

1. Energy Act, No. 1 of 2019 (Kenya).
2. Vision 2030 Energy Sector Plan.
3. IEA (2023), Kenya Energy Outlook.
4. ERDA Case Study (Buck, 1982). Sources Cited in the Brief
5. The South African National Energy Development Institute (SANEDI) - www.sanedi.org.za
6. Kenya Industrial Research and Development Institute (KIRDI)
7. The Institute for Research in Solar Energy and New Energies (IRESEN) – www.iresen.org
8. U.S. Department of Energy - www.energy.gov/ia/research-technology-economic-security
9. International Energy Agency (IEA). (2025). Kenya – 2024 Energy Policy Review. Retrieved from https://www.iea.org/reports/kenya-2024/executive-summary
10. International Energy Agency (IEA). (2024). Kenya's energy sector is making strides toward universal electricity access, clean cooking solutions and renewable energy development. Retrieved from https://www.iea.org/news/kenya-s-energy-sector-is-making-strides-toward-universal-electricity-access-clean-cooking-solutions-and-renewable-energy-development
11. Enerdata. (2024). Kenya Energy Information. Retrieved from https://www.enerdata.net/estore/country-profiles/kenya.html



Published by
Sustainable Energy Access Association - Kenya



Contact

Head Office
National Water Plaza
Nairobi, Kenya
+254 759 486 834
info@seaa-k.org
seaa-k.org

SEAA-K
Sustainable Energy Access Association of Kenya