— STRATEGIC INTELLIGENCE BRIEFS: RESILIENCE SERIES —

PART 2

RENEWABLES FOR ECONOMIC RESILIENCE

REN21

STRENGTHENING ECONOMIC RESILIENCE

Resilience is the capacity to recover, adapt, and develop when faced with adversity, challenges, or stress. Resilience is about bouncing back from difficult situations, maintaining strength, and learning from experiences to emerge stronger. It is not about avoiding hardship but responding to it, drawing on strengths, support systems, and coping strategies to move forward. Resilience might be best conceptualised as an ability for stakeholders to cope with all kinds of risks and shocks, whether predicted or unforeseen[1].

Economic resilience is the capacity of an economy — whether local, national, or global — to **endure, recover from, and adapt to disruptions**. These can range from economic recessions and natural disasters to financial crises, pandemics, trade conflicts, or technological shifts. Economic resilience reflects how effectively an economy can **absorb shocks** while **preserving** or **restoring essential functions**.

About the resilience series

The impacts of climate change are escalating worldwide and building resilience is now inevitable. Strengthening climate, economic, and societal resilience is crucial for adapting to climate change and limiting further harm. This series examines how renewable energy plays a pivotal role in strengthening resilience as we confront the climate crisis.

REN21's Strategic Intelligence Briefs spotlight critical gaps in the energy landscape, providing data-driven insights to shape powerful renewable energy narratives, support informed debates among stakeholders, and foster collaborative global strategies within its community.

RENEWABLE ENERGY: A CATALYST FOR ECONOMIC STABILITY AND ENERGY SECURITY

Renewable energy drives economic resilience by reducing dependence on imported fossil fuels while developing local renewable energy supply chains, creating jobs, and supporting sustainable, decentralised energy systems.

The transition to renewables stimulates job creation across sectors like manufacturing, installation, maintenance, and research, with the sector growing by 18.2% in 2023 and supporting approximately 16.2 million jobs globally. Each dollar invested in renewables creates three times as many jobs as equivalent fossil fuel investments, significantly boosting local economies.

Renewables drive innovation by advancing energy technologies and infrastructure through ongoing research and industrial development. They shield economies from energy price volatility by reducing reliance on fossil fuel imports, which are susceptible to geopolitical tensions and supply chain disruptions. Enhanced energy security and price stability make economies more resilient, especially as renewable energy costs continue to decline.

Investments in renewable energy support sustainable industrial practices, fostering economic models that align with environmental goals while reducing long-term pollution and climate related costs. Decentralised renewables ensure a stable energy supply, minimising financial losses during natural disasters and infrastructure failures while providing power access for local industries and end users in underserved areas.

With comprehensive policy support, renewables can deliver greater benefits to communities, offering sustainability and stability in times of disruption, especially for remote and vulnerable populations.

To realise renewables' transformative potential, we must accelerate electrification, increase investments in renewable energy supply chains, technologies and infrastructure, enhance energy efficiency, and develop enabling policies and regulatory frameworks.

RENEWABLES FOR ECONOMIC RESILIENCE: KEY TAKEAWAYS

Renewables Support Stable, Secure, Resilient Economies and Societies

Renewable energy strengthens economic resilience by driving local job creation and supply chains, empowering communities, and fostering sustainable, self-reliant energy systems—building a more stable and independent economy.

Renewable Energy is a Key Pillar of Economic Resilience

Renewable energy fosters a more democratic energy landscape by reducing reliance on fossil fuel monopolies and fostering local ownership and decision-making opportunities. With substantial cost savings and growing competitiveness over fossil fuels, renewables play a critical role in long-term economic stability.

Policy Support Optimises Economic Resilience through Renewables

Effective policies attract investment, drive innovation, and support infrastructure development, reducing reliance on volatile energy imports. When governments prioritise renewable energy incentives, they empower local economies, create jobs, and enhance resilience to disruptions.

Renewables Need Stronger Financial Support

Accessible funding expands renewable energy projects, lowers energy costs, addresses infrastructure challenges and creates local jobs. Financial support for renewables helps communities reduce reliance on fossil fuels, ensuring greater economic stability and resilience against market fluctuations.

A Multistakeholder Approach is Critical

Building economic resilience with renewable energy requires collaboration across national governments, local authorities, multilateral development banks, UN agencies, private companies, NGOs, foundations, and academia. Each stakeholder contributes through policy support, funding, advocacy, and research — essential for advancing renewables and stabilising economies.

Seize the Opportunity

Renewables-based energy systems provide a path to resilient economies, especially in communities and regions vulnerable to economic shocks. Investing in decentralised, sustainable energy infrastructure strengthens local economies and reduces reliance on volatile energy imports, fostering a stable, self-sufficient future.

Call To Action

Preparing economies for a complete transition to renewable energy requires strategic planning, investment, and systemic transformation across all sectors of energy use. This ensures energy security, strengthens economic resilience, and fosters sustainable development.

RENEWABLES SUPPORT STABLE, SECURE, RESILIENT ECONOMIES AND SOCIETIES

Renewable energy delivers transformative benefits that enhance economic stability.

Stimulates local job creation and economic development.

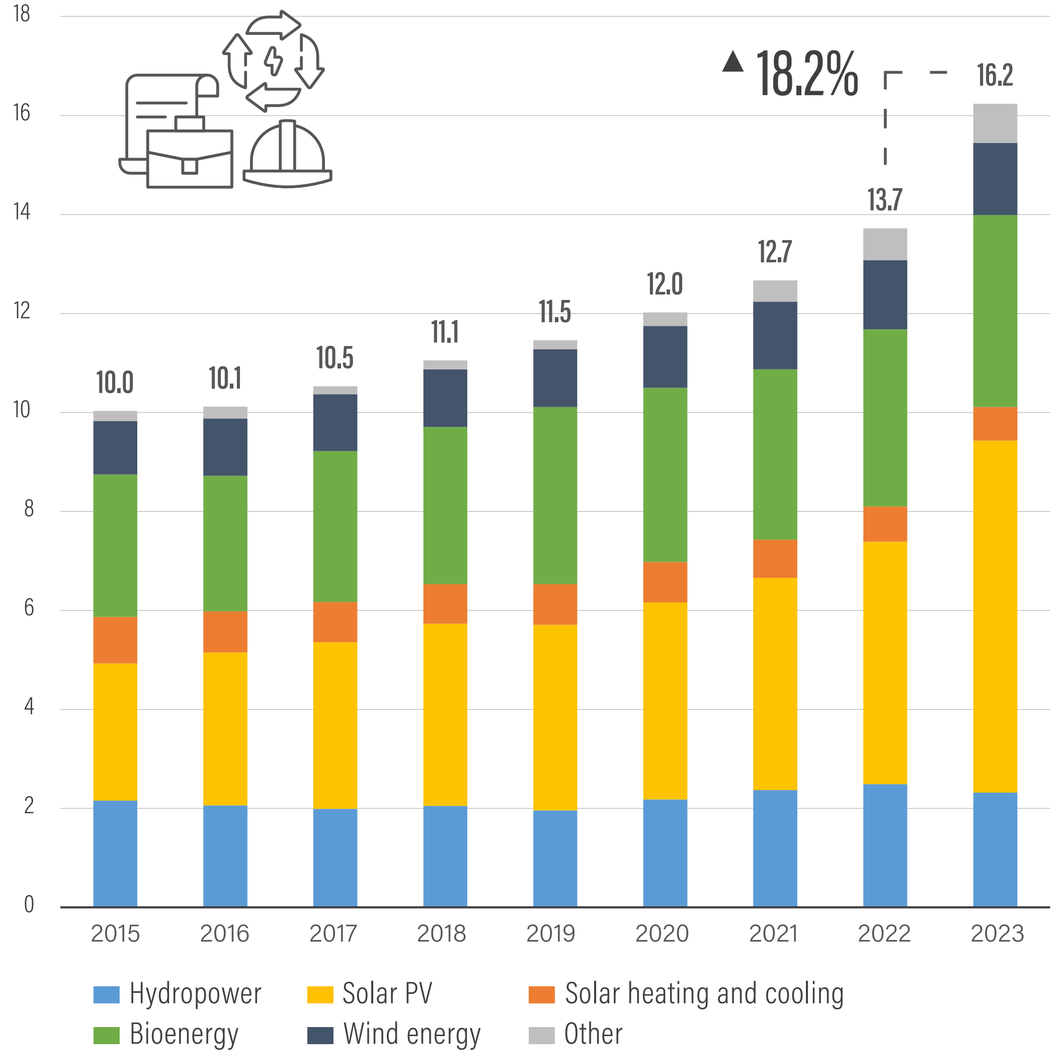
Empowers local communities.

Encourages local ownership and local supply chains.

Strengthens economic stability by keeping energy investments within the domestic economy.

Supports sustainable and resilient energy systems.

FIGURE 1 Global Renewable Energy Employment, by Technology, 2015-2023.



Renewable energy industries created **16.2 MILLION** global jobs in 2023 (see Figure 1), about an **18.2%** growth rate compared to the previous year[2].


Kunal Gupta / Climate Visuals Countdown

Investments in renewable energy generate **THREE TIMES MORE** jobs per dollar than fossil fuels[3].


Gaganjit Singh / UN Women

RENEWABLE ENERGY IS A KEY PILLAR FOR ENERGY SECURITY AND INDEPENDENCE

Transitioning to renewables boosts national resilience and strengthens energy security.

Minimise dependence on fossil fuels.

Relying on domestic energy sources reduces exposure to global fuel price fluctuations and potential supply disruptions.

Support local energy independence.

Enhance national energy security and sovereignty.

Exercise greater control over national and local energy policies.

RENEWABLES DRIVE INDUSTRY GROWTH AND INFRASTRUCTURE RESILIENCE

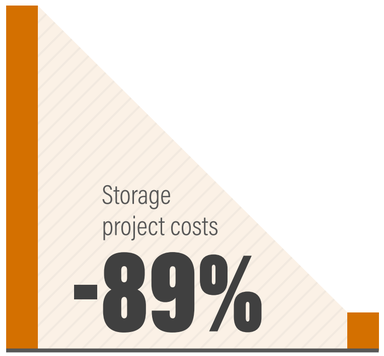
Renewable energy supports industry expansion, cuts energy costs, and addresses infrastructure challenges.

IN 2023:

7%

Renewables and enabling technologies[4] accounted for **7%** of global GDP growth[5].

"Clean" energy[6] added around **USD 320 BILLION** to the world economy[7].



Since 2010, storage project costs have dropped by **89%**, facilitating the integration of high shares of solar and wind capacity by helping address grid infrastructure challenges[8].

Challenges such as **high interest rates** and **higher input costs** for key raw materials, including critical minerals, shaped the market in 2023, revealing opportunities for proactive strategies to drive future stability and market resilience.

RENEWABLE ENERGY IS THE COST-EFFECTIVE PATHWAY TO A GLOBAL ENERGY TRANSITION

Renewables lead the way in the energy transition with massive cost savings and competitive gains.

IN 2023, RENEWABLES REACHED NEW HEIGHTS[9]:

A record 473 gigawatts (GW) of added renewable power, with **81%** of these utility-scale projects costing less than their fossil fuel counterparts.

96% of newly installed solar and wind projects had lower electricity generation costs than new fossil fuel plants.

Renewable power generation deployed between 2010 and 2023 is estimated to have reduced electricity sector fuel costs by at least **USD 409 BILLION.**

THREE-QUARTERS of the newly built wind and solar PV plants were cheaper to operate than existing fossil fuel plants.

A DECREASE in the global weighted average cost of electricity from newly commissioned renewable projects:

- Solar photovoltaics (PV) by 12%
- Onshore wind by 3%
- Offshore wind by 7%
- Concentrating solar power (CSP) by 4%
- Hydropower by 7%.

POLICY SUPPORT IS NEEDED TO BUILD ECONOMIC RESILIENCE WITH RENEWABLES

Building economic resilience through renewable energy requires a holistic approach that combines policy support with strategic action.

Energy system infrastructure and innovation policies:

Diversification of Energy Sources: Encourage a mix of renewables to enhance stability.

Research and Development: Foster innovation to improve efficiency and reduce costs.

Energy Storage Solutions: Invest in storage technologies for reliable energy supply.

Grid Modernisation: Upgrade infrastructure to support renewable integration.

Economic and financial policies:

Public-Private Partnerships: Facilitate collaboration to fund projects and share risks.

Financial Mechanisms: Implement incentives to lower investment barriers.

Job Training Programs: Equip the workforce with skills for renewable energy jobs.

Social and environmental policies:

Community Engagement: Involve local communities in decision-making to reflect their needs.

Resilience Planning: Integrate renewables into economic and disaster resilience strategies.

Climate Change Mitigation and Adaptation: Align policies with climate goals for long-term sustainability and integrate renewable energy in climate strategies.

Responsible sourcing, sustainable production, and environmental compliance: Reduce waste and labour exploitation in the renewable energy sector, fostering a resilient, socially responsible, and sustainable industry.

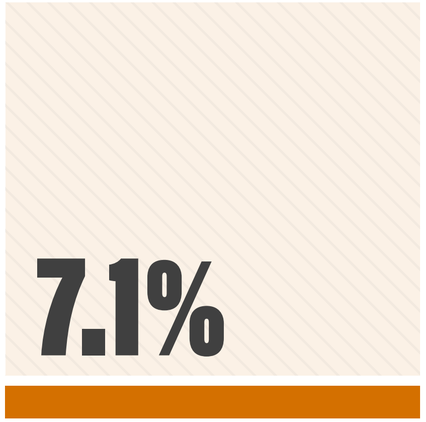
NEED FOR ROBUST FINANCIAL SUPPORT TO STRENGTHEN ECONOMIC RESILIENCE WITH RENEWABLES

Funding is a crucial and non-negotiable support lever to strengthen economic resilience with renewable energy. To ensure a sustainable and transformative transition, renewable energy systems should rely as little as possible on fossil fuel-based revenues.

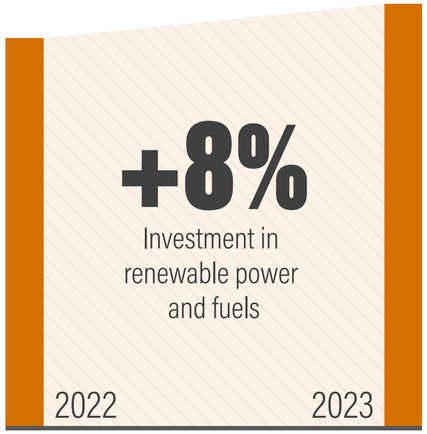
Investing in renewables as an economic resilience response:

- **Strengthens** energy security.
- **Mitigates** energy price volatility.
- **Reduces** long-term energy costs.
- **Supports** job creation and local economies.
- **Enables** infrastructure upgrades and innovation.
- **Promotes** environmental and public health resilience.

In 2022, global subsidies for fossil fuels amounted to **USD 7 TRILLION,** representing **7.1% OF GLOBAL GDP**[11].



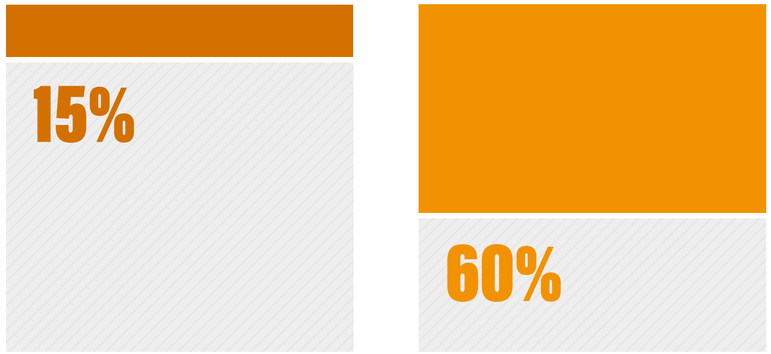
In 2023, a record **USD 623 BILLION** was invested in renewable power and fuels, growing **8%** over 2022[10].



RENEWABLE ENERGY IS DRIVING ECONOMIC RESILIENCE IN AFRICA

Shifting to renewables not only enhances operational resilience but also supports the region's economic development (stability, jobs, competitiveness) and climate goals.

AGRICULTURE IN AFRICA:



Represents over **15%** of Africa's GDP,

Employs more than **60%** of the continent's labour force[12].

Integrating renewables in agriculture enhances productivity, reduces costs and addresses energy access challenges[13]:

Rwanda - The Nasho Solar-powered Irrigation Project uses solar energy to improve irrigation, boosting crop yields, water efficiency, and food security for small-scale farmers.

Kenya - Solar-powered cold storage facilities reduce post-harvest losses by providing off-grid, affordable cooling solutions for small-scale farmers, improving food security.

Launch of Nasho Solar-powered irrigation Project, Rwanda
Paul Kagame

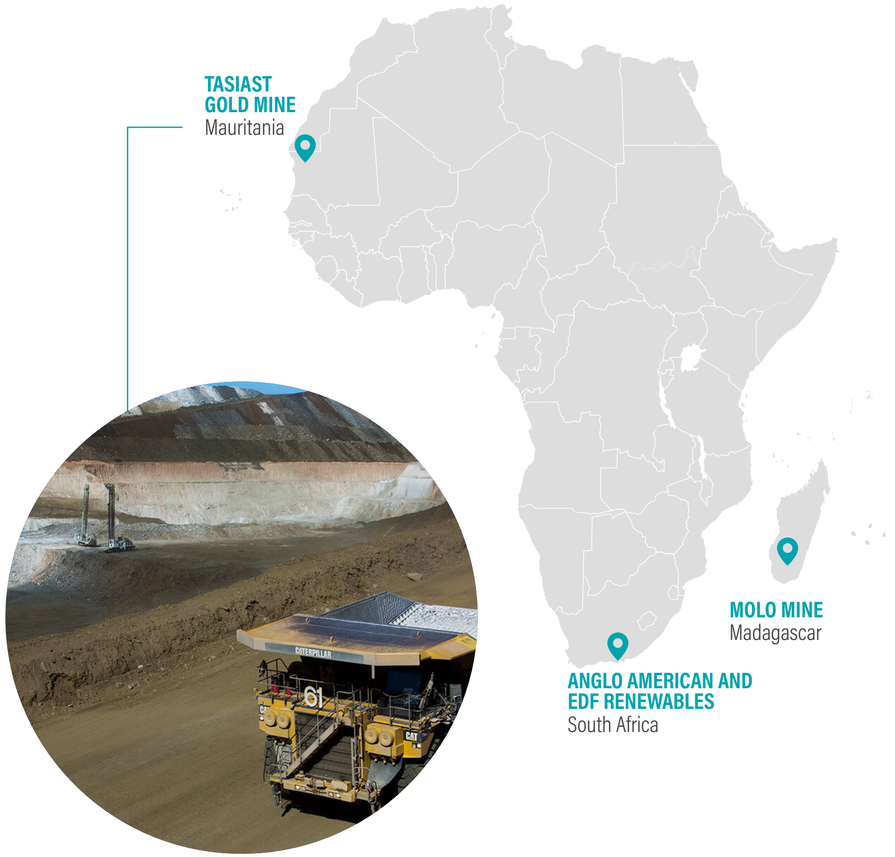
MINING SECTOR IN SUB-SAHARAN AFRICA:

Is valued at over **USD 108 BILLION** in 2023[14].

Could grow regional GDP by **12%** by 2050, leveraging over 10% of projected global mineral revenues worth $16 trillion[16].

Consumes **32%** of its energy in the form of electricity in 2022, with electricity generation costing **BETWEEN 10 AND 35%** of the mining project cost[15].

HARNESSING SOLAR POWER TO TRANSITION AFRICA'S MINING SECTOR



To combat high energy costs and unreliable power, mines are shifting from diesel to hybrid microgrids with solar PV and energy storage, promoting operational sustainability and economic resilience. Examples include[17]:

- **Mauritania** - Tasiast gold mine: A 34 MW solar PV plant supplies 20% of its energy needs and reduces greenhouse gas emissions by 530,000 tonnes.
- **Madagascar** - Molo mine: A 2.69 MW solar PV plant meets 35% of its energy needs, cutting carbon emissions by 2,275 tonnes annually.
- **South Africa** - Anglo American and EDF Renewables are developing a renewable energy ecosystem to power operations with 100% renewable electricity by 2030[18]. The project includes solar, wind energy, and storage solutions, enhancing energy resilience, supporting decarbonisation and stimulating local economies.

Stakeholders must acknowledge the environmental and social impacts of mineral extraction and collaborate to advance sustainability through integrated policies and effective, actionable measures.

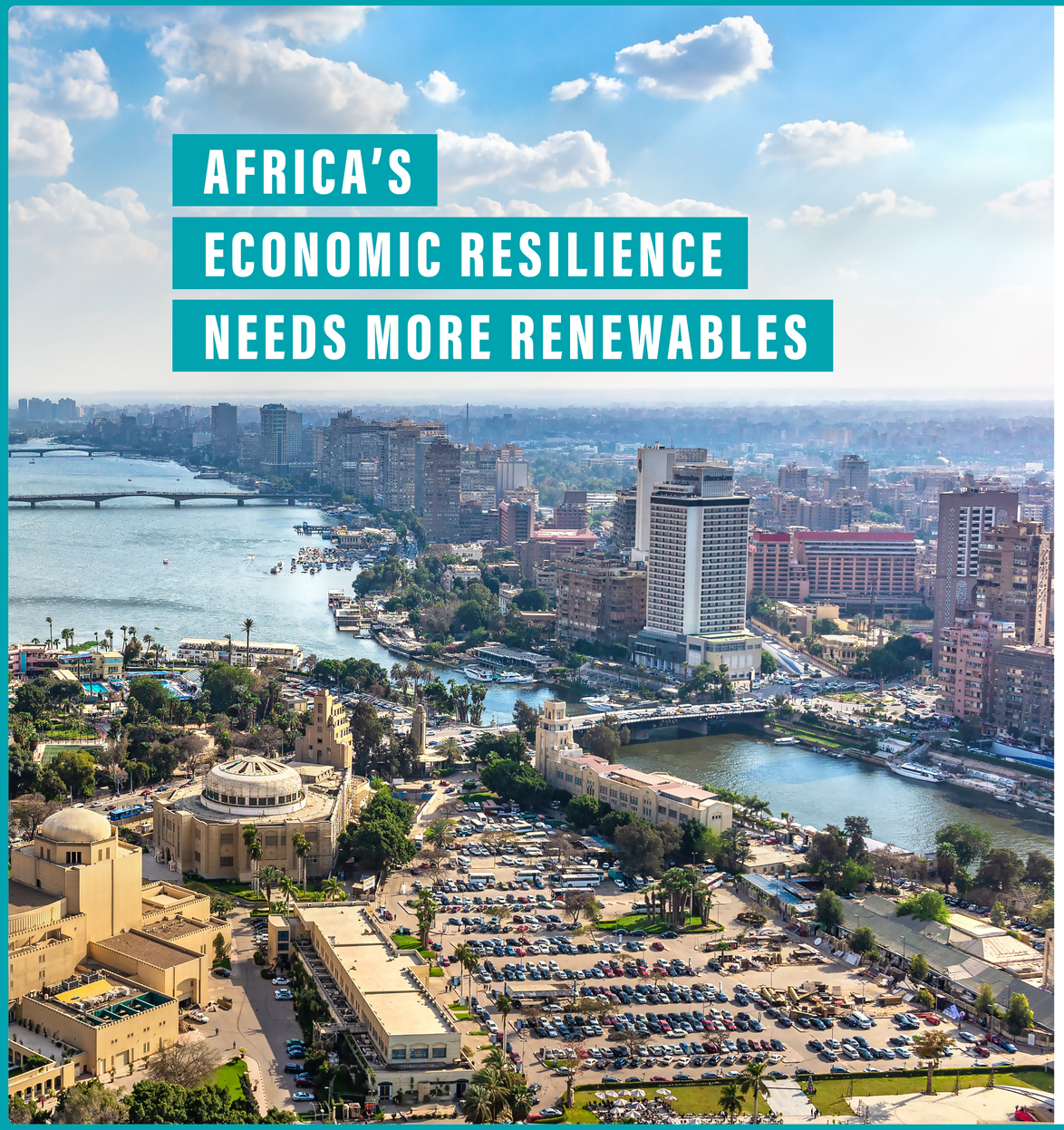
ARE INVESTMENTS IN RENEWABLES ON THE RISE IN AFRICA?

Raphael Pouget / Climate Visuals Countdown

While the share of renewable energy investment in Africa and the Middle East is growing, it remains relatively small, highlighting significant potential for growth. This shift reflects a global momentum towards renewables, with emerging markets playing a critical role in driving the transition.

IN 2023[19]:

- Investment in renewable power and fuels in the Middle East and Africa **jumped 59%** to reach about **USD 22.5 billion,** representing **3.61%** of global investments (estimated at USD 622.5 billion) in 2023.
- **South Africa**'s renewable energy investment increased to **USD 5.3 billion**, and **Kenya** emerged as a regional leader, with investment in renewables rising nearly 28-fold to **USD 3.3 billion**.



Despite the growing recognition of renewables as a cost-effective energy source across Africa, the continent's vast renewable potential remains untapped, limiting opportunities for economic resilience.

IN 2023[20]:

- Although Africa is home to nearly **20%** of the world's population (**See Figure 2**). However, the continent generates only **2%** of the world's electricity, leaving around **600 MILLION** people without access to power.
- Annual electricity sector fuel savings from renewables totalled just **USD 1 BILLION** in Africa, with no growth over the last 13 years.
- At around **USD 11 BILLION**, Africa represents **2.7% OF GLOBAL SAVINGS** (USD 409 billion) from renewable power generation deployed between 2010 and 2023.

FIGURE 2 Renewable Energy Capacity and Population, by region, 2023

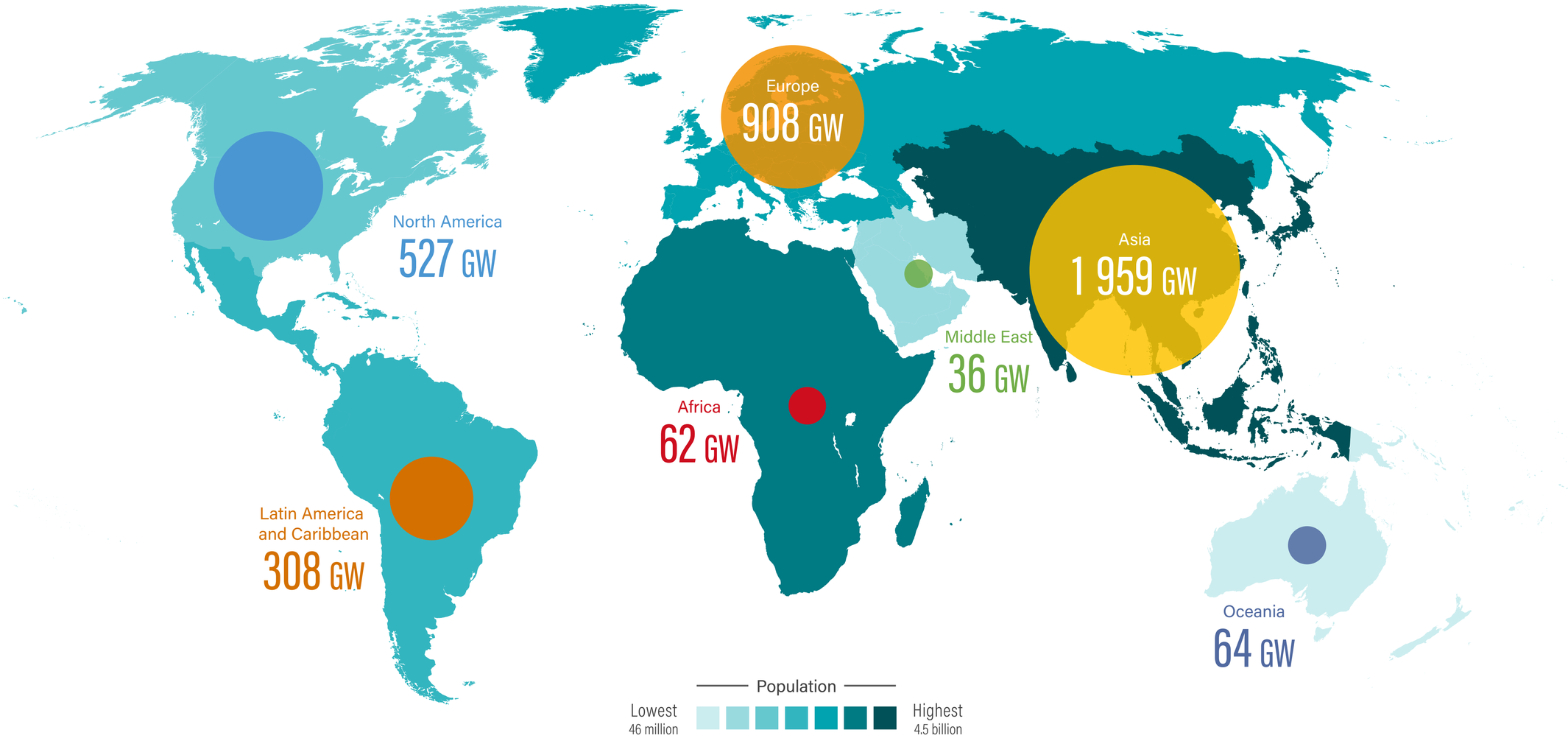
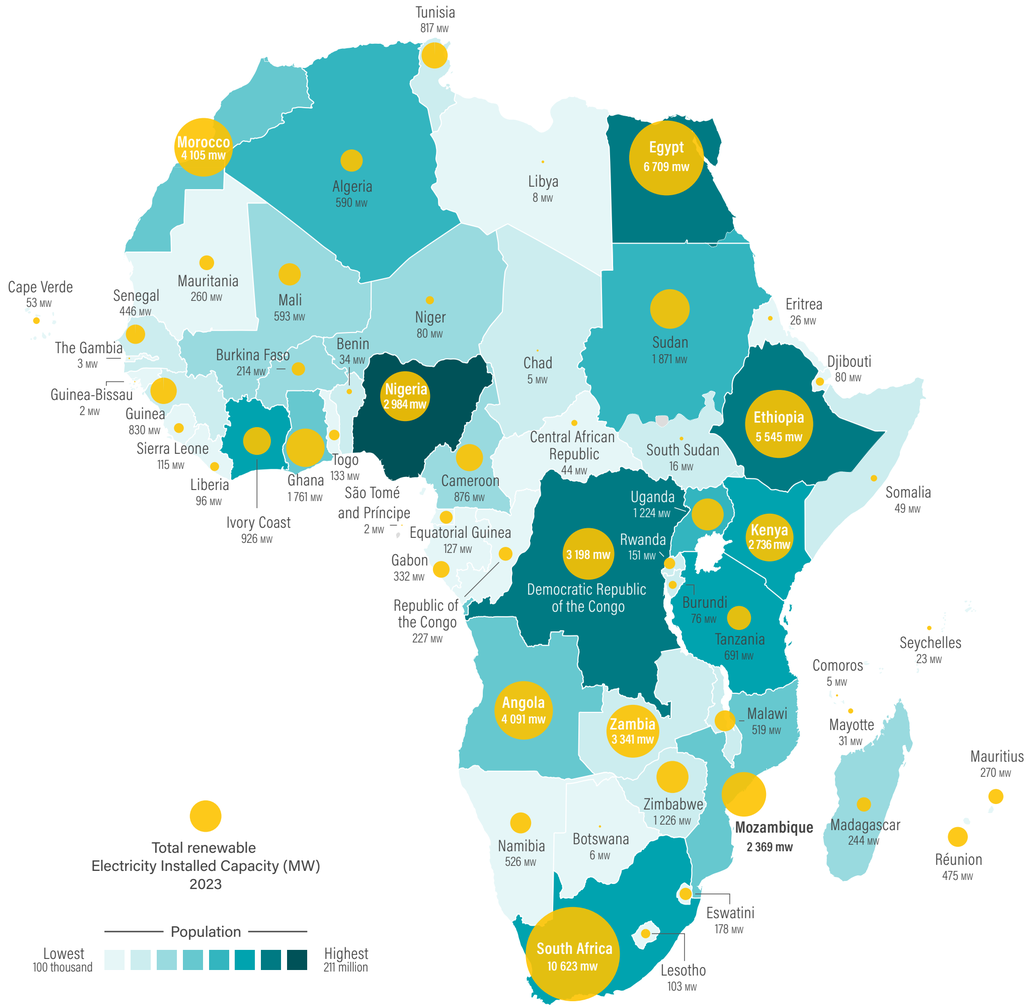


FIGURE 2 Africa's renewable energy capacity and population (Map).

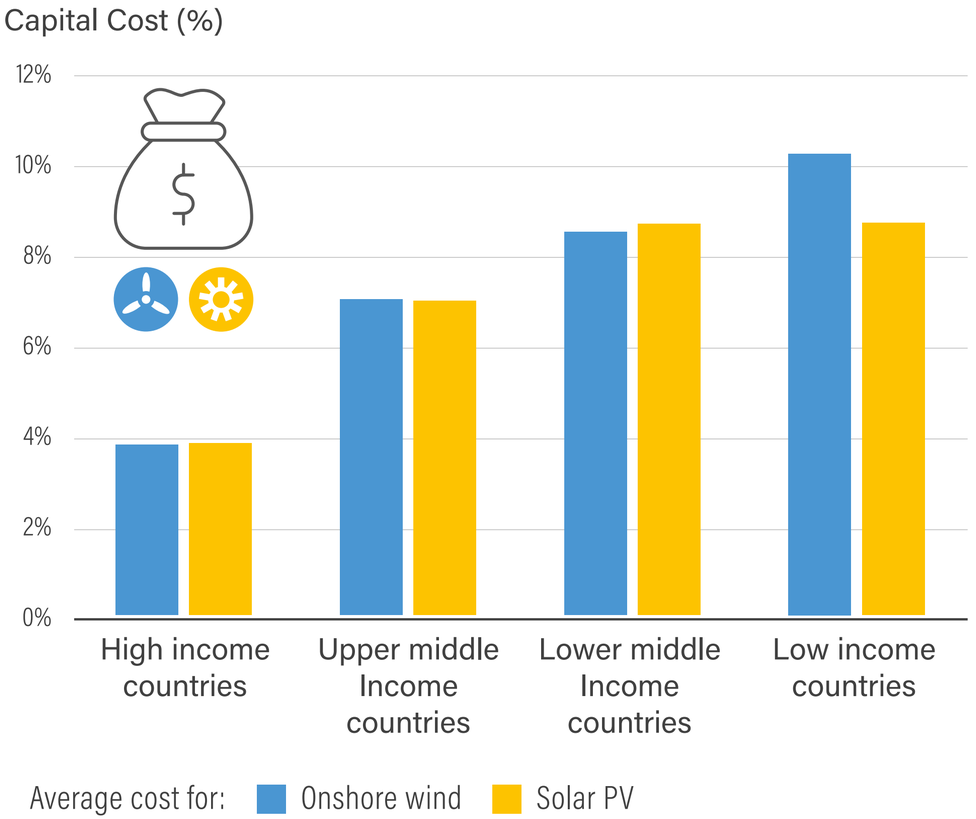


IN 2022:

The cost of capital for onshore wind and solar PV was **over 4 percentage points higher** in low-income economies than in high-income economies **(See Figure 3).**

FIGURE 3

Weighted Average Cost of Capital for Onshore Wind Power and Solar PV, by Country Income Level, 2022[21].



Note: The weighted average cost of capital (WACC) is the average rate a business pays to finance its assets. It is calculated based on the cost of debt and equity. The country divison is based on the World Bank country classifications by income (Fiscal Year 2024). Each income bracket includes the countries for which data are avaialbe in the IRENA database.

ECONOMIC RESILIENCE IS DRAWING SIGNIFICANT MEDIA ATTENTION ACROSS THE AFRICAN CONTINENT

Media coverage heatmap – Economic resilience:

South Africa, Nigeria, Egypt, Kenya and Morocco have received the most media attention on economic resilience.

Media about economic resilience was tracked via *Atium* (REN21's strategic intelligence tool). It covered the following issues: Critical Minerals, Energy Security, Resource Nationalism, Competitive Bidding, Investments, Employment and Livelihood, Local economic development, and Manufacturing.

Time frame: 01 April - 30 September 2024.

The insights' data reflect the total volume of media content (mentions and posts) related to the topic and do not indicate the regional stand towards a specific topic.

South Africa

President Ramaphosa outlined South Africa's **economic reforms**, focusing on **renewable energy**, particularly through the Energy Action Plan. The plan aims to expand renewable generation, increase rooftop solar, and improve Eskom's infrastructure to reduce load shedding. These initiatives aim to **enhance energy security**, **promote economic development**, and **attract investment**, ensuring a sustainable and resilient energy future[22].

Nigeria

Nigeria's **solar market** is set for growth driven by **innovative financing models** like "energy as a service" and government incentives (tax holidays, grants, and low-interest loans). These strategies reduce costs, attract investment, and foster a sustainable energy transition, creating economic and environmental benefits across the solar value chain[23].

Egypt

Egypt is exploring **"climate capitalism",** aligning economic development with environmental goals through renewable energy, sustainable agriculture, and waste-to-energy initiatives[24]. The country is poised to advance its renewable energy and manufacturing sectors with Saudi Arabia's **USD 5 billion** investment, focusing on **renewable energy** and **electric vehicles**[25]. In collaboration with the Green Hydrogen Organisation, Egypt's **new green hydrogen centre** will also boost innovation, job creation, and regional cooperation[26].

Kenya

Kenya is advancing its renewable energy leadership with strategic actions: releasing **green hydrogen production guidelines** aligned with its 2030 goal for 100% renewable electricity[27]; launching the **Geothermal Risk Underwriting Facility** to attract private investment in geothermal energy[28]; and bidding to host the **2029 World Geothermal Congress**[29]. These initiatives aim to leverage Kenya's 10,000 MW geothermal potential, attract foreign investment, and accelerate its transition to renewable energy.

Morocco

Morocco is set to **quadruple** its annual renewable energy investments to **USD 1.5 billion** from 2024 to 2027 in a strategic push to reduce its energy imports[30]. Supporting this goal, Morocco's Competition Council has approved a joint venture between Australia's Fortescue Ltd and Morocco's OCP Group. This 50-50 venture will develop **green ammonia and fertilizer facilities**, **renewable power plants**, and an **R&D hub** near Marrakech focused on renewable energy and mineral processing[31].

INTEGRATING RENEWABLES FOR ECONOMIC RESILIENCE

Countries must reassess their strategies and integrate renewable energy to boost economic resilience.

INVESTING IN RENEWABLES FOR ECONOMIC RESILIENCE WILL:

Enhance energy security and independence.

Support equitable and resilient economies and societies.

Reduce the need for reliance on fossil fuels.

Abir Abdullah / Climate Visuals Countdown

A multistakeholder approach is crucial to funding renewable energy and building resilience. Governments, banks, UN agencies, businesses, NGOs, and universities must collaborate and contribute policies, funding, advocacy, and research to advance renewable energy projects and resilience efforts.

CALL TO ACTION

It is time to fully leverage renewables for economic resilience:

Prioritise energy efficiency and renewable energy diversification.

Increase investment in renewable energy and research and development (R&D).

Cut fossil fuel subsidies.

Modernise energy infrastructure.

Develop comprehensive policies and targets that support the transition to renewable energy.

Empower local economies through skilled workforce development and strategic resilience planning.

Consolidate data on how renewables can enhance economic resilience.

Encourage cross-sectoral, multi-stakeholder, and multi-level collaboration.

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