Africa Climate Insights

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Powering Senegal's future: why renewable energies are the the real driver of a just energy transition, beyond greenwashing and false solutions

Senegal has abundant renewable resources, particularly for electricity generation from solar photovoltaic energy. As part of its Just Energy Transition Partnership (JETP) agreement, the country has set itself the goal of achieving a 40% share of renewable energy in its electricity mix by 2030 and a 70% increase in its total production capacity. However, while the share of solar and wind power in Senegal's electricity mix has grown rapidly, from around 5.7% in 2019 to 17.3% in 2022, the growth rate stabilized in 2023.

At the same time, Senegal is developing its gas production and aims to increase its use for electricity generation. This fact sheet highlights the benefits that increased commitment to renewable energy can bring globally, and more specifically to Senegal's economy and society.

Investing in renewable energy creates jobs

The number of jobs in the renewable energy sector is growing rapidly worldwide. The International Renewable Energy Agency (IRENA) estimates that there were 16.2 million jobs in the renewable energy sector in 2023, an increase of 18% compared to 2022. Solar photovoltaics is the largest employer in the electricity sector, with 7.1 million workers in 2023, followed by hydropower with 2.3 million. The wind sector employed approximately 1.5 million workers.

The solar and wind sectors employed around 48% of workers in the global energy sector in 2023, far exceeding the 32% employed in the oil, gas, coal and nuclear sectors combined. IRENA estimates that global employment in the renewable energy sector could reach around 30 million jobs by 2030 in a scenario consistent with the Paris Agreement's 1.5°C target. In contrast, jobs in fossil fuel energy production are expected to decline.

Countries that are committed to the transition to renewable energy are experiencing rapid job growth in this sector. In China, for example, jobs in the "clean energy" sector accounted for more than 10% of new jobs across the economy, while in other regions such as the United States, the European Union, and Japan, they accounted for between 4% and 6% of new jobs.[1]

[1] The IEA's definition of "clean energy" includes electricity generation from renewable, nuclear, and fossil sources equipped with carbon capture, utilization, and storage (CCUS) systems; battery storage; and electricity grids. It also includes energy efficiency, electric vehicles, and hydrogen use.

Globally, it is widely accepted that the transition to renewable energy will create more jobs than will be lost through the closure of fossil fuel power plants. In addition, the construction of renewable energy projects generates many more jobs per unit of installed capacity than coal or gas power generation projects, and these jobs are generally more skilled.

Renewable energy does not only create jobs in electricity generation. It also contributes to employment in the expansion of the electricity grid, which is necessary to accommodate new renewable energy projects. Globally, employment in this sector grew by 6% between 2019 and 2023.

Overall, IRENA estimates that up to two million new jobs could be created in Africa in the renewable energy and electricity grid sector by 2030. These would be mainly concentrated in the solar photovoltaic sector (up to 1.7 million jobs), but the wind and electricity grid sectors would also see significant growth.

Decarbonization can contribute to economic growth

Access to energy is the foundation of economic growth. Traditionally, economic growth has been linked to increased carbon dioxide (CO2) emissions resulting from the use of fossil fuels to power businesses, industry, and transportation. However, this relationship is changing.

dissolving thanks to improved energy efficiency and the expansion of renewable energy technologies. This divergence is already observable in Africa, where emissions growth is lower than economic growth.

Some data indicate that the transition to a low-carbon economy can help stimulate economic growth, particularly in China, where "clean energy" contributed to about 20% of total GDP growth in 2023. Overall, certain clean energies added approximately $320 billion to the global economy in 2023, representing 10% of global GDP growth that year.[2]

Renewable energy helps improve access to energy

The technologies can improve access to modern energy services. Unlike many fossil fuel technologies, renewables are highly scalable and can be deployed in small, local units, eliminating the need for costly large-scale power plants and extensions to the central electricity grid. This evolution means that they can be used in local mini-grids, micro-grids, or stand-alone solar systems. A recent study by the International Energy Agency (IEA) argues that these decentralized solutions will be essential, particularly in rural areas, to achieve universal access to electricity in Africa.

[2] This includes the manufacture of "clean energy" technologies (solar photovoltaics, wind energy, and battery manufacturing). ; the deployment of clean energy generation capacity (investments in electricity generation capacity such as solar photovoltaics, wind power, nuclear power, battery storage, and electricity grids) and the sale of clean equipment (electric vehicles (EVs) and heat pumps). This does not include the value added to the global economy by other renewable or storage technologies.

The costs of building and operating renewable energy projects such as wind and solar power are falling rapidly, and the price of their output is relatively stable compared to fossil fuel technologies, as there are no fuel costs to consider. However, renewable technologies have high upfront costs, which can be a barrier to access. The introduction of innovative pricing systems such as "pay-as-you-go" can help customers overcome the financial barrier and enable more people to access electricity.

Senegal's goal was to achieve universal access to electricity by 2025. Access has increased across the country, from 69.6% in 2018 to 84.3% in 2023, although rural areas lag behind the overall average, with access at 65.6% in 2023. Despite this increase, the government's 2025 targets for electricity access, both nationally and in rural areas, have not been met, although the IEA does not expect universal access to be achieved until around 2030.

Small-scale, scalable renewable systems will be essential to achieving universal access to electricity in Senegal. Mini-grids and solar home systems will be the least expensive solution for approximately 25% of Senegalese households that still do not have access to electricity.

Renewable energy is cheaper than fossil fuels.

The latest data from IRENA shows that renewable energy is the most cost-competitive way to generate electricity from new power plants: in 2024, 91% of utility-scale projects were operating at at a lower cost than new fossil fuel alternatives. Onshore wind projects were the cheapest source of energy, followed by solar photovoltaic energy.

In addition, the construction of renewable projects can reduce or avoid the need to build infrastructure for fossil fuel extraction, and can reduce dependence on fossil fuel imports and exposure to price volatility. The IEA estimates that renewable projects built since 2010 have saved fossil fuel-importing countries around the world approximately US$1.3 trillion in coal and natural gas import bills. IRENA therefore asserts that the value of renewable projects is much greater than a standard economic assessment of the cost of building and operating the projects, when their additional long-term benefits in terms of energy security, public health, and environmental sustainability are taken into account.

Electricity rates in Senegal are relatively high compared to those in other countries in the region. Senelec's current rate for domestic users starts at 91-111 CFA francs/kWh, while rates for businesses start at 163-165 CFA francs/kWh and those for large users vary between 140 and 232 CFA francs/kWh, depending on the time of use. In contrast, two solar projects, Kahone Solaire and Kael Solaire, produce electricity at around 26 CFA francs/kWh, one of the lowest prices for solar energy producers in sub-Saharan Africa. It is not appropriate to directly compare electricity production costs and Senelec tariffs, as Senelec tariffs also include network usage fees, a profit margin, and other factors, but the magnitude of the difference between the two is striking.

Renewable energy and storage can provide reliable energy

Since renewable technologies do not require fuel (with the exception of bioenergy), renewable energy can help reduce a country's dependence on fossil fuel imports and enhance energy security. Renewable energy also offers price stability, protecting economies from the volatility of fossil fuel prices.

Solar and wind projects operate in a variable manner, as they depend on sunlight or wind speed to achieve optimal performance. This variability has often been considered a problem for the security of electricity grid operations, and it has been identified as an issue for the electricity grid in Senegal due to a lack of investment in its electrical infrastructure. However, the IEA points out that the problem lies not in the characteristics of solar and wind power generation, but in the lack of flexibility with which electricity grids have been operated in the past, and has called on Senegal to prioritize the integration of renewable technologies.

Batteries and other storage technologies are increasingly being used to store electricity generated by solar and wind projects when conditions are favorable, and release it during periods of high demand or low production.[3] This can help balance electricity flows on the grid, thereby enhancing electrical security. It can also help ensure the deployment of more variable renewable projects without threatening the stability of the electricity grid. Depending on the technologies used, long-duration energy storage can also delay the need for major upgrades to grid infrastructure.

The cost of batteries that can improve the operation of variable renewable energy projects is falling rapidly, with a 93% decline between 2010 and 2024. This is the result of technological improvements and economies of scale achieved through the installation of a growing number of storage projects. The benefits of coupling renewable energy installations with energy storage technologies such as batteries are reflected in the rapid growth of the storage market. Global deployment in 2025 already reaches 92 GW, 23% more than in 2024.

This growth is also evident in African energy systems: storage on the continent has increased from 157 MWh in 2023 to 1,641 MWh in 2024.
The Scatec Kenhardt solar/battery project in South Africa is one of the largest in the world and has been awarded a contract under the country's risk reduction IPP program, designed to help alleviate supply constraints.

Senegal is also beginning to invest in solar/storage projects to ensure a reliable electricity supply. The Walo Storage project was the first hybrid system in West Africa and was specifically designed to help maintain the balance of the electricity grid. The Kolda project is expected to be completed in 2026 and will be the largest solar and battery storage project in West Africa, powering approximately 25,000 homes and contributing to grid security. A storage system was recently commissioned.

[3] There is a whole range of products that can fulfill this function, including electrochemical storage such as lithium-ion batteries, thermal energy storage for storing heat, mechanical technologies such as compressed air storage or pumped hydroelectric technologies, and chemical storage.

at the Taïba N'Diaye wind farm to store production and help stabilize the grid.

Beware of false solutions

The Senegalese government has developed a gas-to-power strategy aimed at increasing electricity production from domestic gas. This strategy is part of its JETP with the International Partners Group (IPG). The plan is to build more than 3 GW of generation capacity by 2050, representing 75% of total generation capacity. This approach carries significant risks, particularly if gas reserves are lower than expected or are not exploited as quickly as planned.

The Yakaar-Teranga gas project is central to the government's plans to convert gas into electricity. However, the progress of the project is far from certain given the scale of investment required both for the project itself and for the infrastructure needed to support it. In general, gas-fired projects are more difficult to finance, as development finance institutions tend to no longer support them, while investments in infrastructure may not offer a sufficient return to attract the private sector. On the other hand, access to financing is more favorable for renewable energy projects.

The production of green hydrogen has also been mentioned as a possible energy option for Senegal. However, green hydrogen production is an inefficient use of electricity, even if that electricity is generated from renewable resources. Converting electricity into hydrogen and then back into electricity has a round-trip efficiency of around 18% to 46%, which is low compared to other energy storage technologies such as pumped storage and compressed air storage.

The green hydrogen market is also extremely uncertain. Most of the global demand is currently met by hydrogen produced from fossil fuels, and demand for low-emission hydrogen remains "very low" due to its higher cost. While green hydrogen may have a role to play in industries that are difficult to decarbonize on a global scale, it is considered too risky, inefficient, and costly to be used in sectors where renewable energy is already a more stable and affordable option for investment and deployment.