Africa Climate Insights

HEINRICH BÖLL STIFTUNG
DAKAR
Sénégal

Renewable Energy in Senegal: Towards a Just Energy Transition

This document highlights the challenges and opportunities of a sustainable and equitable energy future for Senegal.

Senegal: Between Fossil Fuels and Renewable Ambitions

Senegal is at an energy turning point, set to become an oil and gas producer in 2024. The country must now balance the exploitation of these resources for its development and its climate commitments.

Historically dependent on **fossil fuels** for more than **70% of its energy needs**, representing **20%** of its import bill, Senegal is aiming for an ambitious transition. Installed capacity is 1.6 GW, with electricity consumption growing at an annual rate of 7-8%. While access to electricity is almost universal in urban areas, it reaches around **60%** in rural areas.

Supported by **€2.5 billion** from the Just Energy Transition Partnership (JETP), the country has set itself the target of achieving **40% renewable energy** by 2030, incorporating major solar and wind projects.

Key Energy Transition Statistics

29.3

Renewable energy mix in 2022

In the electricity mix

2.5

Euros mobilized

Via the JETP

40

Renewable energy target

By 2030

1.6GW

Installed capacity

Total

7-8

Annual growth

Electricity consumption

60

Rural access

To electricity

20

Import bill

Fossil fuels

Negative Impacts of Fossil Fuels: A Worrying Reality

Environmental impacts

Oil and gas exploitation causes degradation of marine and coastal ecosystems due to operational discharges (production water, chemicals) and increased risks of oil spills. This disrupts marine biodiversity, affecting fish nurseries, breeding grounds, and species migration routes. Traditional fishing areas are restricted around platforms, limiting access for fishermen.

Socio-economic impacts

Coastal communities are experiencing a drastic decline in income. Local studies report reductions in catches of 35% to 50% in affected areas, with 78% of fishermen surveyed reporting a decrease in their income. Increased fuel costs (e.g., +25%) and job losses in artisanal fishing and related activities are leading to widespread precariousness.

Climate Impacts

Senegal's energy sector, which is heavily dependent on fossil fuels, is responsible for 9,618.33 Gg CO_2eq, or 81% of total national emissions. Methane (CH_4), the main component of natural gas, has a global warming potential (GWP) 28 times higher than that of CO_2 over 100 years, contributing significantly to global climate change even when burned internally.

Testimonials: The Impact on Fishermen in Saint-Louis/Guet Ndar

Before the platforms were installed, fishermen in Guet Ndar, Saint-Louis, had free access to rich and varied fishing grounds. Today, they face a different reality:

- **Access restrictions:** "The oil platforms have restricted our fishing areas and reduced our catches by 35 to 50%. We are forced to fish further away, with increased risks and skyrocketing fuel costs." **-Testimony of Oumar Sarr, fisherman for 30 years.**
- **Impact on the local market:** The decline in catches has a direct effect on the Saint-Louis fish market, leading to higher prices for consumers and a decline in the availability of local species. Fishmongers are seeing their incomes fall.
- **Conflict and insecurity:** "We encounter security patrols who push us away from restricted areas, often without a explanation. This adds to the stress and insecurity of our work." - **Fatou Diop, fish seller.**

Fishing communities are calling for transparent compensation and sustainable economic alternatives to address these challenges.

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Exceptional Potential for Renewable Energy in Senegal

Solar: An Inexhaustible Resource

Senegal enjoys exceptional sunshine, with average solar radiation of **5.5 to 6 kWh/m²/day** and more **than 3,000 hours of sunshine per year.** Currently, 226 MW are installed, representing 13.6% of the energy mix. The exploitable technical potential is estimated at over 1**,000 GW,** offering immense opportunities. Production costs have fallen by 80% in 10 years, making solar energy increasingly competitive. Projections indicate high profitability for large-scale projects and significant job creation in installation and maintenance (an estimated 5**,000 new jobs** by 2030).

Wind power: A latent force

With average wind speeds of **5 to 7 m/s** on the north coast (Saint-Louis and Thiès regions) and even **>8 m/s** in some coastal areas, the wind energy potential is considerable. The Taïba Ndiaye wind farm (158 MW) proves the viability of this sector. The exploitable technical potential is estimated at 1**,500 MW.** Compared to neighboring countries such as Mauritania (high potential) or Morocco (leader in Africa), Senegal has significant room for improvement. Wind power can generate skilled jobs (engineers, technicians) and reduce energy costs in the long term.

Hydropower: A Regional Mainstay

The Senegal and Gambia rivers offer untapped hydropower potential. The average annual flow of the Senegal River is around **20 billion m³**. Existing dams (Manantali, Diama) already contribute to the grid, but additional potential is estimated at **200-300 MW** through infrastructure optimization and the construction of small dams. This stable source of energy is crucial for the balance of the mix and for regional cooperation, for example with the OMVS. It offers advantages in terms of flood control and irrigation, creating jobs in rural areas.

Biomass & Biogas: The Circular Economy

The potential for biomass in Senegal is immense, with an estimated annual tonnage of agricultural waste amounting to **several million tons** (millet, rice, peanut, and bagasse residues). More than 2 **,300 biodigesters** have already been installed, transforming waste into biogas. The theoretical potential for electricity production from biomass and biogas is **150 MW,** which would reduce dependence on wood energy.
This sector supports the local economy by recovering waste, producing natural fertilizers, and creating green jobs in the collection and processing of inputs.

Economic and Employment Projections

The development of renewable energies could reduce the cost of electricity by **15-20%** by 2035, thereby attracting investment. Senegal is aiming for **30% renewable energies** in its electricity mix by 2030, with ambitious targets to increase installed capacity to **4 GW**. This could generate more **15,000 direct and indirect jobs** in manufacturing, installation, maintenance, and research. Regional comparisons show that Senegal is on track, but needs to accelerate the transition to achieve cost parity with fossil fuels in certain sectors and become a leader in West Africa.

The JETP: A Historic Opportunity

The Just Energy Transition Partnership (JETP) for Senegal, launched at COP27 in November 2022, aims to support a just and clean energy transition in the country.

Main Objectives

Achieve 40% renewable energy in the electricity mix by 2030 and reduce GHG emissions by 30%.

Strategic Financing

Mobilization of **€2.5 billion** over 3 to 5 years by a consortium of international partners (France, Germany, UK, Canada, EU).

Social and Economic Impact

Ensuring a socially equitable transition and creating local green jobs.

Strategic Partners

Countries: France, Germany, United Kingdom, Canada, European Union. They provide financial, technical, and political support. EU

Financial Institutions

Key players: World Bank, African Development Bank (AfDB), European Investment Bank (EIB). They facilitate investments and concessional loans.

Major Challenges

- Lack of awareness of the JETP at the local level
- Low proportion of grants vs. loans
- Lack of participatory governance
- Need for local capacity building

Implementation & Expectations

The JETP is planned for an initial period of 3 to 5 years (2023-2027), with regular evaluations. It mainly combines concessional loans with grants to unlock private investment.

Private Sector: Driving the Transition

01

Key Role of Private Actors

The private sector is essential to catalyzing Senegal's energy transition. **Private investment accounts for 70% of the financing needed** to achieve climate goals, complementing public funding. Technological innovation, such as off-grid solar solutions adapted to the local context, is driven by agile companies. This dynamic also creates **tens of thousands of green jobs (**engineers, technicians, installers) and develops local skills, accelerating the deployment of renewable energies (RE).

02

Specific Opportunities

The RE market in Senegal is booming, with a **potential of 2 GW by 2030**. Promising niche activities are emerging, such as self-production for industry, mini-grids for rural electrification, and solar pumping
for agriculture, which can **reduce farmers' energy costs by 30%**. Public-private partnerships (PPPs) offer secure frameworks for large-scale projects. Local expertise can be exported to the sub-region, positioning Senegal as a hub. In addition, the JETP provides privileged access to international financing, reducing the cost of capital for green projects.

Concrete example: The **Senegalese** company **Senergy** recently raised €5 million to expand its Pay-As-You-Go solar solutions, proof of the market's attractiveness.

03

Major Challenges to Overcome

Despite the opportunities, the private sector faces challenges. Access to financing remains an obstacle,
particularly for SMEs, with the **cost of capital up to 2 points higher** than elsewhere. The regulatory framework, although evolving, still requires simplification of administrative procedures. The lack of skilled technical expertise and appropriate training is hampering growth. Competition from imported solutions, sometimes subsidized, is weighing on local production. Finally, political and exchange rate risks can discourage long-term investors.

Testimonial: "Obtaining permits can take months, which significantly delays our projects," says a local entrepreneur specializing in mini-grids.

04

Specific Role in the JETP

The JETP aims to overcome these challenges by actively involving the private sector. Support mechanisms are being put in place, including **dedicated credit lines for local businesses** and a guarantee fund for medium-sized projects. The selection criteria for private projects in the JETP prioritize local impact, innovation, and job creation. **The local content law, by encouraging the use of Senegalese goods and services, amplifies this impact by promoting the participation of national companies in renewable energy projects.**
Guarantees and risk mitigation instruments (such as exchange rate guarantees) are being developed to secure investments.
Capacity-building and technology transfer programs are also planned to support the growth of Senegalese stakeholders.

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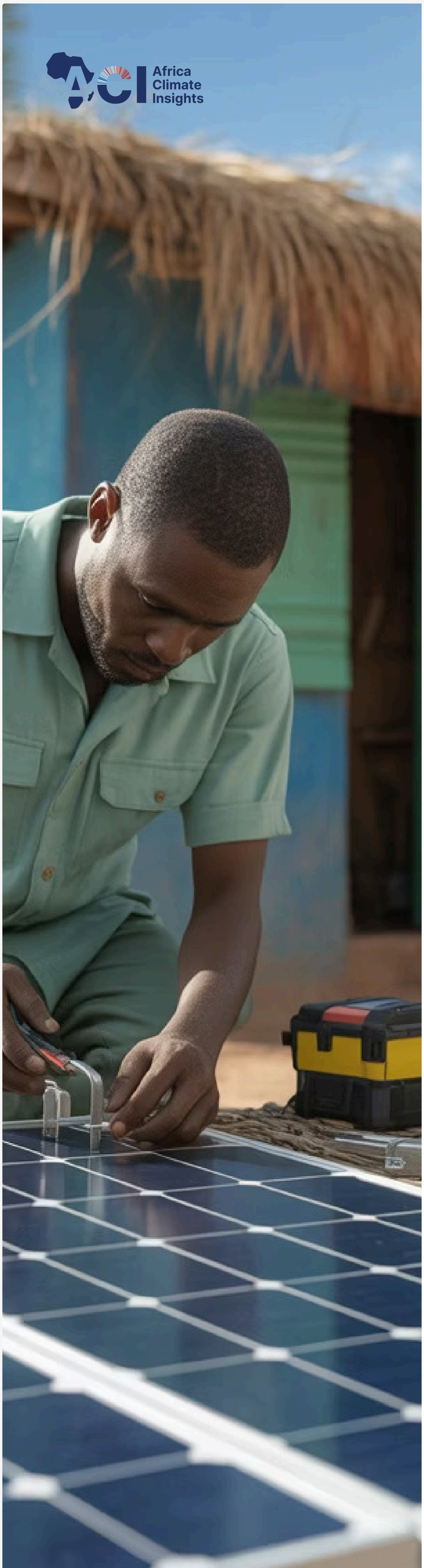

Major Obstacles to Energy Transition

Financing

Difficult access to capital: **83% of SMEs** are unable to invest. Cost of capital **2 points higher**.

Regulation & Administration

Complex and slow procedures: permits >**12 months.** Lack of regulatory stability.

Skills & Maintenance

Shortage of qualified technicians (estimated at **40%**) and maintenance issues: **58% of users** encounter technical difficulties.

Infrastructure & Quality

Inadequate network (renewable energy capacity limited to **20%**) and proliferation of low-quality equipment without strict standards.

Social Acceptance

Resistance to projects (visual/noise) and lack of public awareness of the benefits of renewable energy.

Strategic Recommendations for a Sustainable Energy Transition in Senegal

Participatory Governance

Actively involve local communities in all phases of renewable energy projects, from planning to implementation and monitoring. To ensure acceptance social and ownership, it is crucial to establish transparent consultation mechanisms and local monitoring committees. The goal is to achieve **a 75% community involvement rate** in key project decisions by 2025, thereby reducing the risk of social conflict.

Equitable and Universal Access

Accelerate rural electrification by prioritizing off-grid and mini-grid solutions for remote and vulnerable populations. The national goal of universal access to a clean, reliable, and affordable electricity by 2029 will be supported by dedicated programs, ensuring that **100% of rural households** have access to electricity at regulated and subsidized rates for the most disadvantaged. Smart meters will enable optimized management and controlled costs.

Integrated Approach and Holistic Planning

Promote integrated energy planning that covers not only electricity generation but also key sectors such as transportation, industry, and building sector. The aim is to achieve deep decarbonization and significantly increase energy efficiency through the adoption of green building standards and the development of electric transport. The ambition is to reduce **national energy intensity by 15%** and integrate **at least 20% of renewable energy** into heating and cooling needs by 2030.

Enhanced Coordination and Strategic Partnerships

Establish effective cross-cutting coordination mechanisms between all national (ministries, agencies, private sector) and international (donors, technical partners) actors. The creation of a national energy transition agency could streamline efforts, optimize synergies, and accelerate project implementation. The goal is to formalize **5 key new partnerships** per year and to reduce project approval times **to less than 6** months by 2026.

Innovative and Structuring Financing

Rethink financing mechanisms by introducing innovative instruments such as blended finance, green bonds, and impact investment funds.

Increasing smart subsidies and developing robust guarantee funds are essential to de-risk projects and encourage massive private investment. The goal is to attract **USD 2 billion in private investment** in renewable energy by 2030 and to reduce the cost of capital for these projects by at least **3 percentage points**.

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Towards a 100% renewable Senegal

A just energy transition is not only a climate necessity, it is an opportunity for sustainable and inclusive development.

Vision 2030

- 40% renewable energy in the mix
- Universal access to electricity
- Creation of 50,000 green jobs
- 30% reduction in GHG emissions
- Enhanced energy independence

Priority actions

- Develop a national transition plan with clear indicators
- Strengthen local capacity in new professions
- Ensure gender equality in the transition
- Ensure free and informed consent from communities

> "Senegal has everything it needs to become an African model for a just energy transition. We must now move from commitments to concrete action, placing communities at the heart of this transformation."