



# ENERGIZED

Policy innovations to power the transformation of  
Africa's agriculture and food system



**S**enegal has improved access to and use of energy to foster economic growth, including in the agriculture sector due to policy coherence and long-term programmatic commitment. Between 1992 and 2013, the electricity expansion indicator<sup>i</sup> increased by 8.55, thereby being slightly above the average of 8 for Africa as a whole. During the same time period, the agricultural value added per worker growth rate averaged 2.68 percent annually.<sup>1</sup> In addition, with a score of 39 out of 100 on the RISE index<sup>ii</sup> in 2017, Senegal is a middle performer in terms of setting good national policy and

regulatory frameworks for sustainable access and use of energy.

## Institutional Innovations

Several institutions in Senegal work towards the development of energy provision and use. Of these, the Ministry of Oil and Energies – formerly the Ministry of Energy and Renewable Energy Development – is the main actor and is responsible for the design and implementation of national energy policies. The Ministry develops energy supply plans and ensures their execution

i - This indicator is expressed in logarithm of the difference of number of Nighttime Lights pixels between 1992 and 2013.

ii - The World Bank's Regulatory Indicator for Sustainable Energy (RISE) assesses countries' policy and regulatory support for each of the three pillars of sustainable energy—access to modern energy, energy efficiency, and renewable energy. RISE classifies countries in three groups based on their score levels as strong performers (those with a score  $\geq 67$ ), middle performers (those with a score  $\geq 34$  and  $< 67$ ), and weak performers (those with a score  $\leq 33$ ).



through coordination among stakeholders. It also leads and regulates the exploration, extraction, and production of crude oil, natural gas, and other hydrocarbons.<sup>2</sup>

The National Electricity Company of Senegal (SENELEC) was created in 1983, as a majority public limited company that holds a monopoly of purchase, transmission, and sale of electricity. It is the largest electricity generator, and the only provider for on-grid transmission and distribution services.<sup>3</sup>

In 1998, the Regulatory Commission of the Electricity Sector (CRSE) was created as an independent agency to regulate the production, transmission, distribution, and commercialization of electricity. CRSE also promotes competition and private sector participation at all stages of the electricity supply chain, and contributes significantly to securing investments by ensuring the financial viability of companies in the electricity sector. At the same time, the CRSE protects the interests and rights of consumers regarding prices, supply, and quality of electrical energy.<sup>4</sup>

The Senegalese Rural Electrification Agency (ASER) was created in 1999 under the auspices of the then Ministry of Energy (now the Ministry of Oil and Energies). ASER administers rural electrification policies and provides technical and financial support to businesses and individuals involved in rural electrification initiatives. ASER designs rural electrification priority programs, reviews and adapts lessons learnt in Senegal and elsewhere, develops innovative lower-cost solutions, and mobilizes funding.<sup>5</sup> ASER also leads the diffusion of photovoltaic solar systems across the country.<sup>6</sup>

The Agency for Saving and Control of Energy, created in 2011, focuses on sustainable energy consumption and implements the national policy of managing energy resources for sustainability. To do so, the Agency employs a strong integrated framework that considers the main forms of energy used, including electricity, domestic fuels, and petroleum products.<sup>7</sup>

Furthermore, in 2013, the National Agency for Renewable Energies was established to promote the use of renewable energies in all sectors of the economy. The agency aims to:<sup>8</sup>

- Contribute to the development of an attractive legislative and regulatory framework for the development of renewable energies
- Identify, evaluate, and develop potential renewable energy programs across the country
- Develop and execute national renewable energy projects and programs and ensure their coherence

- Contribute to the improvement of R&D and encourage innovation in renewable energies
- Popularize the use of equipment for the generation of electricity from renewable energy sources
- Conduct prospective and strategic studies for the development of renewable energies.

## Policy Innovations

Senegal's energy policy has been formulated through "Letters of Energy Sector Development Policy." Under the first Energy Policy Letter (EPL) formulated in 1997, the government sought to reduce inefficiencies in the energy sector and increase the affordability of energy by using subsidies to reduce the cost of supply. The government had also planned to strengthen the role of Independent Power Producers (IPPs) in the energy sector, however, private sector involvement in the energy sector did not reach the level envisioned by the 1997 EPL. To fully achieve the targets set under the EPL 1997, the government signed a second EPL in 2003 which called for a greater role for the private sector in financing the development of the national energy sector and reducing the costs borne by consumers.<sup>9</sup>

### *Crowding in Independent Power Producers*

In 1998, Senegal also passed legislation to liberalize the energy sector, allowing IPPs to produce electricity. Since then, IPPs have been mushrooming, contributing to the achievement of electrification targets. SENELEC, the national electricity company, has an electric power generation fleet and purchases electricity from IPPs, such as Tobène Power and Centrale solaire Bokhol, which are connected to its network and inject their electricity generation into the national network.<sup>10</sup>

To meet increasing demands for energy – particularly electricity – the government has prioritized the development of renewable energy and biofuels since 2007. Under the EPL of 2008, the government seeks to:<sup>11</sup>

- Develop and exploit Senegal's renewable energy potential
- Diversify energy sources, particularly for electricity, by tapping into mineral coal sector, biofuel, biomass, solar, and wind resources
- Amplify hydropower through regional cooperation, particularly within river basin organizations and the West African Power Pool.



The fourth EPL, covering the period 2012 to 2017, sought to ensure the provision of sufficient, affordable, and clean energy by diversifying the country's energy mix. It aimed to increase the share of renewable energy in total supply as a means to reduce the country's vulnerability to exogenous shocks. It also sought to improve access to modern energy services across the country by ensuring a more equitable distribution of investments and by targeting some of the poorer and remote regions and vulnerable groups. An equitable distribution of energy services was also highlighted under the Plan for an Emerging Senegal 2012-2035. In addition, the Plan recommended a better articulation of energy within the strategic sectors of development – including agriculture – for an effective reduction of poverty and protection of the environment through the promotion of clean energy.<sup>12</sup>

## Programmatic Interventions

### *Prioritizing Access in Rural Areas*

The electrification rate in Senegal's urban areas increased significantly between 2000 and 2010, from just 58 percent to 90 percent. Given the low rate of rural electrification of 9 percent in 2000, the government designed and implemented several programs to significantly increase rural electrification.<sup>13</sup>

The Rural Electrification Action Plan for the period 2002 to 2022, which seeks a rural electrification rate of 60 percent, illustrates the government's programmatic commitment.

The ambitious 20-year plan has three complementary programs. Under the Priority Rural Electrification Program (PPER), the provision of electricity is conferred to the private sector, and the country was split into 10 concession areas. To be awarded a concession area, private investors are required to finance at least 49.15 percent of the investment costs for electricity provision in that area. SENELEC is not authorized to operate in the 10 zones in order to avoid competition with private initiatives.<sup>14</sup> However, only 6 out of 10 concessions areas have been conferred to the private sector, largely due to limited cooperation with SENELEC and resistance among local populations due to difference in prices and levels of service from private sector entities compares to those offered by SENELEC.<sup>15</sup>

Another program, the Local Rural Electrification Initiative, promotes viable local approaches to rural electrification initiated by communities or the private sector to accelerate the electrification of communities outside the PPER or SENELEC's areas of intervention. These include the promotion of mini-grids and use of alternative sources of electricity, such as wind, solar, micro hydro, and biomass. This initiative has resulted in a significant increase in the use of renewable energies, especially solar. Finally, the Multisectoral Energy Program (PREM) aims to broaden the social and economic benefits of electrification. PREM also seeks to stimulate electricity consumption in rural areas for agricultural use and livestock management.<sup>16</sup>



In 2015, Senegal's government approved the National Program for Rural Electrification to further accelerate rural electrification. To do so, an Emergency Plan covering the period 2015-2017 was implemented, as well as an Additional Plan for Universal Access by 2025 ("Programme Complémentaire pour l'Accès Universel à l'horizon 2025").<sup>17</sup>

### *Struggling to Jumpstart Biofuel Production*

Furthermore, a program under the EPL of 2008 promoted the production of jatropha at scale, highlighting the government's reliance on biofuels to improve Senegal's fuel supply. The program, which drew on Brazil's experience, aimed to increase jatropha cropping among smallholders for fuel production.<sup>18</sup> The program sought to plant jatropha on 1,000 ha to produce about 1.19 billion liters of jatropha biofuel per year beginning in 2012.<sup>19</sup> However, in 2012, an opportunity cost assessment of jatropha in the Kaolack and Kaffrine areas showed that jatropha production was not more profitable for farmers than the production of cereals, peanuts and other annual crops, partly due to the lack of a reliable value chain for biofuels.<sup>20</sup>

In addition, between 2010 and 2015, Senegal's National Domestic Biogas Program aimed to provide clean cooking energy to urban and rural households. Initially, the program targeted the installation of 8,000 bio-digesters, yet only 1,000 units were effectively installed within the five years. Although the program did not reach its goal, it did improve farmers' understanding about the role of agriculture and livestock in the bioenergy sector and created jobs through the training of masons and manufacturers. For the second phase (2015-2019), a target of 10,000 bio-digesters was set with a budget of US\$18.2 million funded by the government of Senegal, the European Union, and other partners; this program subsidizes the bio-digesters at a rate of 80 percent.<sup>21</sup>

The policy coherence and the effectiveness of Senegal's rural electrification program have significantly contributed to improved access and use of energy. Yet, the potential of renewable energy remains largely untapped. By increasing the share of renewable energy in the energy mix, the government could further enhance access to and use of energy, particularly in rural areas.

### Endnotes

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