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Recommended citation:
1 Africa

1.1 Eastern Africa

1.1.10 South Sudan

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Key facts

<table>
<thead>
<tr>
<th>Population</th>
<th>10,625,176¹</th>
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</thead>
<tbody>
<tr>
<td>Area</td>
<td>644,329 km²</td>
</tr>
<tr>
<td>Climate</td>
<td>Equatorial climate, with high temperature, high rainfall and very high humidity</td>
</tr>
<tr>
<td>Topography</td>
<td>Plains in the north and centre to southern highlands. The White Nile is a major geographic feature of the country supporting agriculture and extensive wild animal populations. The centre of the country contains a large swampy area of more than 100,000 km² fed by the waters of the White Nile.</td>
</tr>
<tr>
<td>Rain pattern</td>
<td>Rainfall is the heaviest in the upland areas of the south but diminishes in the north.²</td>
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</table>

Electricity sector overview

Only one per cent of the population has access to power, though intermittently during a 24-hour period. Only seven per cent of the urban areas in South Sudan are electrified and virtually no rural areas have electricity.³ This is because the formal energy sector is limited to only the South Sudanese Electricity Cooperation which operates eight diesel generators with a capacity of 1.5 MW each.

With the help of foreign aid such as United States Agency for International Development (USAID), South Sudan has built independent grid systems in cities such as Yei, Kajo Keji, Malakal, and Maridi. However, a large portion of the energy is from independently operated diesel generators belonging to businesses and private homes.⁴

The country is planning to build about half a dozen hydropower and thermal power plants to help end the near permanent blackouts across the country and to attract investments in manufacturing industries.⁵ China is thought to be providing the capital for significant investment in the energy sector to support both the oil and hydropower sector.⁵

In 2012, the installed capacity of electric power was about 26.8 MW in South Sudan. Some estimates, however, put this figure at 62 MW of installed capacity - around 3 MW per million people, indicative of a severe lag compared to other Eastern African states.⁶ This electric power is divided amongst six South Sudanese towns: Juba, the capital (12 MW), Malakal (4.8 MW), Wau (4 MW), Bor (2 MW), Yambio (2 MW) and Rumbek (2 MW). However, this amount of power needs to be increased to at least 230 MW in order to minimally satisfy the current demand. Juba at the moment needs at least 80 MW (according to power engineers at Juba Power Station) whereas the remaining five towns need at least 150 MW, at 30 MW each. Most of the diesel generators in use are made and brought from Finland. However, these generators frequently stop operating due to technical problems and fuel shortages.

The total electric power required by South Sudan is estimated to be 450 MW. In the coming decades, this amount of electric power is expected to increase along with a booming population and establishment of new industries.

![Figure 1 Electricity generation in South Sudan](image)

Note: Based on installed capacity.

Small hydro power sector overview and potential

South Sudan holds one of the richest agricultural areas in Africa. The White Nile valley has fertile soils and abundant water supplies, which could be developed for small hydropower.² Around 28 per cent of the Nile water flows through South Sudan to Sudan and onward to Egypt but the meteorological and hydrological data collection network for this area and elsewhere were destroyed during the conflict and is currently non-existent.⁵

The potential of hydropower plants capacity is estimated to be 5,583 MW in South Sudan. The small hydropower potential is yet unknown. Below is a list of hydropower plants studied in some of the South Sudanese states with a total potential capacity of approximately 2,225.5 MW (see table). It is estimated that the Fura rapids could yield 60 MW of electric capacity. A rapid only refers to the high-current part of a river. Meanwhile, there are several 700 MW to 800 MW large dam projects envisioned for the White Nile.⁶
Barriers for small hydropower development

There are many challenges that hinder the small hydropower development. These include technical, and ecological issues as well as challenging accessibility and remoteness of the sites. Others are:

- The lack of priority and attention afforded to water resource management. Scarcity of meteorological and hydrological data due to the conflict: it will take some time to generate the lost information and systems;
- Lack of renewable energy policy, legislation and poor technical and institutional capacity;
- Social tensions: South Sudan is a newly established landlocked country which has gained independence in July 2011 following two prolonged conflicts which lasted from 1983 to 2005, six years of autonomy (from 2005) and a referendum in which 98 per cent voted in favour of a South Sudanese state;
- Political instability.

References


