



# RENEWABLE ENERGY IN AFRICA:

An opportunity in a time of crisis

## South Africa

### State of electricity

South Africa's total domestic electricity generation capacity is 51,309 MW from all sources.<sup>1</sup> Approximately 91.2%, or 46,776 MW, comes from thermal coal power stations, while 4,533 MW is generated from renewable energy sources. Eskom, the state-owned utility, dominates the power sector. South Africa experienced scheduled power cuts for short periods in 2018 and 2019, and these have resumed in 2020. The country exports electricity to its neighbours through the Southern African Power Pool.

Of the total population 84.2% have access to electricity, with the same access rate for both urban and rural areas. There are 8.9 million people who do not have access to electricity.

### Relevant energy policy for renewable energy

The country's electricity plan, the Integrated Resource Plan 2019 (IRP 2019), plans for a substantial reduction of the share of coal-fired electricity (72% of 52 GW in 2019 to 43% of 81 GW by 2030), but does include the commissioning of an additional 1.5 GW of coal (not including the capacity still to come online at coal-fired power plants, Medupi and Kusile). The renewable technologies with the largest planned growth are wind (14.4 GW to be added by 2030) and solar PV (6 GW). The Integrated National Electrification Plan includes initiatives to boost electricity access in rural areas and aims to fund an estimated 723,000 grid and 49,650 non-grid connections to households by 2019/20.

Renewable energy investment is promoted under the Renewable Energy Independent Power Producer Procurement Program (REIPPPP), the focus of which has been on-grid IPPs. South Africa's renewables auction programme which had stalled with Eskom's refusal to sign power purchase agreements for nearly three years, was reactivated in April 2018 when the new Energy Minister Jeff Radebe signed the power purchase agreements for the 27 outstanding renewable energy projects from Rounds 3.5-4.

The New Household Electrification Strategy (NHES) aims to achieve universal energy access (97% of households) by 2030 and targets off-grid electrification for 300,000 households by 2025. The National Development Plan has a long-term vision of 5 million solar water heater (SWH) installations by 2030. The rural off-grid electrification programme has been running since 2001 and promotes solar home system (SHS) installation. The Department of Energy is reportedly overseeing the contracting of the supply and installation of equipment. The current building standards of South Africa require that half of the demand for hot water is met by non-electrical element heating, boosting the use of solar water heaters in the country.<sup>2</sup> There is little incentive for off-grid solutions.

### Renewable energy projects

The Renewable Energy Independent Power Producer Procurement Program (REIPPPP) brought down the price of renewable energy and attracted a range of private investors, ranging from multinational private companies and wind turbine and PV cell manufacturers to local private banks. The Development Bank of

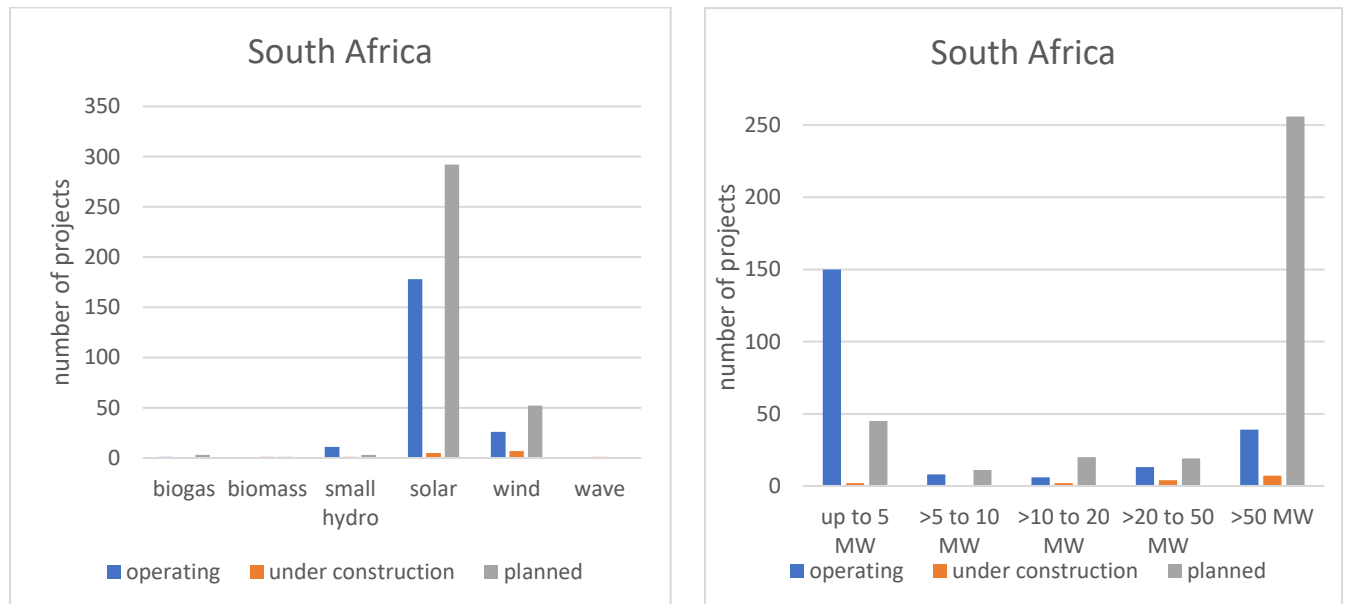
<sup>1</sup> <https://www.usaid.gov/powerafrica/south-africa>

<sup>2</sup> [https://unfccc.int/files/national\\_reports/non-annex\\_i\\_parties/biennial\\_update\\_reports/application/pdf/south\\_africa\\_2nd\\_bur.pdf](https://unfccc.int/files/national_reports/non-annex_i_parties/biennial_update_reports/application/pdf/south_africa_2nd_bur.pdf)



Southern Africa (DBSA), along with the Industrial Development Corporation (IDC) and the Public Investment Corporation (PIC), have provided major support to South Africa’s REIPPPP, contributing ZAR 6.7 billion (approximately USD 558 million) in loans and an additional ZAR 1.3 billion (approximately USD 108 million) in grants under its Black Empowerment programmes for the first two REIPPPP bidding phases.<sup>3</sup> Despite these funding flows, policy uncertainty has slowed renewable energy project development.

The main donors engaging in South African renewable energy and energy efficiency are the United Nations Development Programme (UNDP), the Global Environment Facility (GEF), the Japan International Cooperation Agency (JICA), the Danish Energy Agency, the German Agency for International Cooperation (GIZ), the SECO start up fund, the Renewable Energy and Energy Efficiency Partnership (REEEP), the French Development Agency (AFD), Green Credit Line, the World Bank, AfDB, IFC and Power Africa/USAID amongst others. Many are providing a combination of technical assistance and investment financing to stimulate the market. AFD, for example, is partnering with the IDC, Nedbank and ABSA (both private banks in South Africa) to on-lend for small-scale renewable energy projects. The DBSA is a key funder of the REIPPPP projects. The graphs below show the renewable energy projects at different stages of development with large-scale solar and wind projects being planned.



*Distribution of renewable energy projects in South Africa by technology and scale, by stage of development ('operating', 'under construction', or 'planned'). Source: Authors' estimates from African Energy Live database, September 2019.*

### Off-grid

The solar PV rooftop market has been steadily growing without added incentives and this may perhaps be due to the recent issues regarding electricity supply reliability. Off-grid, more than 96,000 solar home systems powering light, mobile phone charging and a radio and/or TV have been installed under the rural off-grid electrification programme since 2001 (with South African government investment in excess of ZAR 350 million). Other off-grid solutions include the commitment to the rollout of SWH to both low-income and mid-to-high income households.

On the part of local communities, there is a reported lack of trust in off-grid solutions, particularly those provided for free. Off-grid solutions are seen by some critics to be an indication that government is giving

<sup>3</sup> <http://2017.global-climatescope.org/en/country/south-africa/#/enabling-framework>



---

up responsibility to provide grid access. Projects supplying off-grid solutions like iShack have encountered difficulties obtaining buy-in from peri-urban or rural communities on the basis that the government may down-prioritise investment in grid-connection if they see that communities have found their own solutions.<sup>4</sup>

The majority of private sector businesses are engaged in either supplying middle-income households or as contractors for large-scale government programmes. There are some NGO off-grid schemes, but scale has not been achieved in terms of biogas, solar home systems, mini- or micro-grids, solar kiosks or appliances. iShack for example is being subsidised through the free basic electricity allowance to provide solar home systems in informal settlements and rural areas. There is a segment of suppliers that are servicing the energy needs of the domestic and agricultural sector, primarily providing small-scale solar PV and solar water pumping services, such as Kestrel Renewable Energy Installations.<sup>5</sup>

Assessment of the impacts of the initial rollout of the off-grid systems is that the SHS's are not being maintained and have not had the desired impact, understood to be in part due to them being provided for free. The quality of workmanship in installing equipment during the mass rollout of the SWH programme has significant consequences for the credibility of renewable energy solutions.

## Local market

The growing private sector investment and the creation of jobs in the renewable energy sector has increased the influence of the private sector in encouraging policy change. The availability of renewable energy products and technical expertise in South Africa is relatively strong.

Uncertainty makes investment less attractive. Eskom's financial woes continue amid weak power demand, non-payment by municipalities and governance issues, and the utility continues a preference for coal, describing renewables as "expensive" technologies.

Smaller scale IPPs have faced challenges due to the cost of bidding and in securing finances in a risk averse market.

Biogas may hold potential.

The social perception of off-grid energy supply is an obstacle. Solutions would need to provide a comparable level of service to grid connection and establish demonstration projects.

South Africa is likely to be able to offer knowledge transfer to other countries in the region and developing manufacturing capacity.

Building on existing standards and encouraging a diversity of technological and business models will be required.

---

Visit the report webpage at <https://350africa.org/renewable-energy-report>.

---

<sup>4</sup> Conway, D., Robinson, B., Mudimu, P., Chitekwe, T., Koranteng, K. and Swilling, M., 2019. Exploring hybrid models for universal access to basic solar energy services in informal settlements: Case studies from South Africa and Zimbabwe. *Energy Research & Social Science*, 56, p.101202.

<sup>5</sup> REN21, 2018. SADC Renewable Energy and Energy Efficiency Status Report (Paris: REN21 Secretariat)