

# WORLD SMALL HYDROPOWER DEVELOPMENT REPORT 2013

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SOUTHERN AFRICA



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Recommended citation:

Liu, H., Masera, D. and Esser, L., eds. (2013). *World Small Hydropower Development Report 2013*. United Nations Industrial Development Organization; International Center on Small Hydro Power. Available from [www.smallhydroworld.org](http://www.smallhydroworld.org).

# 1 Africa

## 1.4 Southern Africa

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### Introduction to the region

The Southern African region comprises five countries, of which Lesotho, Namibia, Swaziland and South Africa use small hydropower, with Namibia currently having a very limited use of this technology. Botswana does not possess any hydropower plants.

The region has various climatic conditions, from tropical to temperate, semi-arid to desert. A high percentage of the population lives in rural areas and national electrification rates are generally very low

with the exception of South Africa (table 1). Lesotho, Namibia, and Swaziland produce all or a majority of their electricity from hydropower, while South Africa is mostly coal dependent. All countries are members of the Southern African Power Pool (SAPP)<sup>i</sup>; Lesotho, Namibia and Swaziland are net importers of electricity. Lesotho has a very small electricity sector, thus recognizes the benefits of renewable energies. By 2020 the target for Lesotho is that 35 per cent of its electricity for rural electrification should come from renewables.<sup>1</sup>

Table 1

### Overview of countries in Southern Africa

Country	Population (million)	Rural population (%)	Electricity access (%)	Electricity capacity (MW)	Electricity generation (GWh/year)	Installed hydropower capacity (MW)	Hydropower generation (GWh/year)
Lesotho <sup>a b e</sup>	1.930	73	16	76	200	75.7	200
Namibia <sup>a b e h</sup>	2.165	62	34	393	1 430	249.0	1 171
South Africa <sup>a b f</sup>	48.810	38	75	44 175	218 591	700.0	1 082
Swaziland <sup>a c e g</sup>	1.386	79	27	150	470	60.1	124
<b>Total</b>	<b>54.291</b>	-	-	<b>44 794</b>	<b>220 691</b>	<b>1 084.8</b>	<b>1 577</b>

Sources:

a. Central Intelligence Agency<sup>2</sup>

b. International Energy Agency<sup>3</sup>

c. Swaziland Country Report<sup>4</sup>

d. Clean Energy Portal - Reegle<sup>5</sup>

e. The International Journal on Hydropower & Dams<sup>6</sup>

f. South Africa Country Report<sup>7</sup>

g. Swaziland Energy Regulation Authority<sup>8</sup>

h. NamPower<sup>10</sup>

### Small hydropower definition

South Africa de-facto defines small hydropower as below 10 MW because that is the upper limit of hydropower plants in the current bidding process. Other Southern African countries do not have their own definition of small hydropower.

### Regional overview

Four countries in the region have adopted small hydropower.

Lesotho will very soon be able to support projects including small hydropower with its National Rural Electrification Fund.<sup>11</sup> It is to be seen, when the National Integrated Resource Plan for Namibia's electric power system is published in 2013, how small hydropower will be included. South Africa has an Integrated Resource Plan which has given small hydropower an allocation. The South African Government has implemented a bidding process for grid connected renewable energy technologies, which

resulted in an allocation of 75 MW for small hydropower. According to *Green Jobs* by the Development Bank of South Africa, it is estimated that the total net direct employment potential for micro and small hydropower in South Africa in the short term will be 300 jobs in construction, in the medium term there will be 120 jobs in construction and 95 jobs in operation and maintenance. In the long-term 100 jobs will be created in operation and maintenance.<sup>12</sup>

Swaziland has relatively low small hydropower potential compared to other countries in the region. Several small hydropower plants are operational. Due to an expected increase in electricity prices, there is interest in refurbishing old defunct small hydro plants.

The installed small hydropower capacity, defined as up to 10 MW, in the Southern African region is 43.12 MW, with a small hydropower potential of 383.5 MW, (table 2). South Africa dominates the region in terms

of both installed small hydropower capacity and available potential. Its potential includes the novel development of harnessing hydropower using existing infrastructure such as water distribution channels.<sup>12</sup>

Climate change poses a constraint on potential. Namibia's desert climate is not very suitable for hydropower in general, even though the country has a hydropower master plan.<sup>12</sup> South Africa has an annual rainfall of about 500mm, coupled with occasional droughts or floods and seasonal river flows.

Table 2  
**Small hydropower in Southern Africa**  
(Megawatts)

Country	Potential (MW)	Installed capacity (MW)
Lesotho	20.0	3.82
Namibia	108.5	0.50
South Africa	247.0	38.00
Swaziland	8.0	0.80
<b>Total</b>	<b>383.5</b>	<b>43.12</b>

Sources: See country reports.

#### Note

i. Please note that Mozambique, Zambia, Malawi and Zimbabwe which are in the UN region, of Eastern Africa, are also members of SAPP.

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