

ENERGY  
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# Country Guide: Lesotho

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The Kingdom of Lesotho is a lower middle-income Southern African country, entirely landlocked by South Africa. It gained independence from the United Kingdom in 1966. The democratically elected Prime Minister is the head of Government and has executive authority. Ruled by a King as Head of State, Lesotho is a constitutional monarchy with a mixed proportional parliamentary system that consists of a senate and a national assembly.

The country experiences periodic political instability emanating from fractious coalition government arrangements which have led to disruptive impacts on the economy and developmental trajectory of the country.

### Climate and resources

Geographically, Lesotho is unique in that the lowest point lies 1,400 metres above sea level and about 80% of the country lies above 1,800 metres. As a result of this topography, the country's climate is cooler than in most other regions at the same latitude. Typical weather conditions consist of rainy summers (between October and April) and dry winters (between May and September), although higher altitudes frequently experience snowfall.



Figure 2: Lesotho Mountains

The natural resources of significance to Lesotho are water and diamonds. In 2016, diamonds accounted for approximately 35% of exports, with water distribution to South Africa making up 7.2% of exports. The country constitutes one of Southern Africa's principal water catchment areas, accounting for around 50% of the total catchment run-off and is renowned for an abundant supply of pristine water resources.

Lesotho is situated almost entirely within the Grassland Biome, with a rich natural and cultural diversity, unique habitats and high levels of endemism. These natural resources play an important role in sustaining the wellbeing of Lesotho's people (the Basutho), particularly for the rural poor and the unemployed whose livelihoods depend heavily on rangelands, indigenous plant and animal species, wetlands and ecotourism.



Figure 1 Map of Lesotho. Source: d-maps

The annual average rainfall for Lesotho is approximately 720 mm with rainfall varying between approximately 600 mm in the lowlands to 1,300 mm in the north-eastern mountain zone.

Snowfall occurs annually over the mountains and on average occurs once every three years in the lowlands, often resulting in restrictions on movement and access to essential services.

## Demographics and economics

The population of Lesotho is approximately 2.1 million people, with an average population density of approximately 66 persons per square kilometre. When expressed in terms of arable land, the population density rises to 350 people per square kilometre with the majority (58%) being concentrated in rural areas of the country who are heavily dependent on subsistence farming for survival. The agriculture sector remains an important sector for supporting rural livelihoods, with more than 80% of households dependent on subsistence farming.

The age dependency ratio increased from 40% in 2006 to 60.9% in 2016, meaning that for every 100 people in the productive age-group (15 to 64 years), there are 60 people who are depending on them. This significantly reduces the ability of households to alleviate themselves from poverty, as their income and consumption patterns are spread thinly among many members in the household. With an unemployment rate of between 24% and 28%, a poverty rate of 49.7%, and a Gini coefficient of 44.6, Lesotho remains one of the most unequal countries in the world.

Furthermore, having only one border-based trading partner has had a profound impact on the country's political economy, the emergence of industries, the development of the private sector and the country's trade relations.

Despite the continued dependency on subsistence agriculture, the past 30 years has seen some diversification of the economic structure from agriculture and real estate to increasing government services, manufacturing and retail.

Between 2015 to 2018 ,economic growth averaged 1.4% with gross domestic product predicted (pre-COVID 19) to average 1.5% in the next two years. The boost is predicted to come from the construction associated with the second phase of the Lesotho Highlands Water Project (LHWP), as well as continued production within the diamond mining sector.

One of the greatest economic challenges facing the country is the high prevalence of HIV/AIDS and tuberculosis (TB). The incidence of TB stands at 724 cases per 100,000, the second-highest globally, while 25% of the adult population has tested positive for HIV/AIDS. This further exacerbates the vulnerabilities of the Basotho people and negatively contributes to persistently high inequality and poverty.

**Table 1: Lesotho at a glance**

<b>Capital</b>	Maseru
<b>Total Area</b>	30 355 km <sup>2</sup>
<b>Population</b>	2.1 million (2018)
<b>Official languages</b>	Southern Sotho and English
<b>Rural Population</b>	72% (2018)
<b>GDP</b>	US \$ 2 739 M (2018)
<b>GDP Per Capita</b>	US \$ 1299 (2018)
<b>Currency</b>	Lesotho Loti (LSL)
<b>Exchange rate 01/03/2020</b>	1 GBP = 19.91 LSL
<b>Exchange rate 01/03/2018</b>	1 GBP = 16.57 LSL
<b>Access to Electricity</b>	33.73% (2017)
<b>Urban electricity access</b>	69.56% (2017)

Encouragingly, in the yearly World Bank survey on “Doing Business”, a comparison of business regulation in 190 economies, Lesotho scored higher than the sub-Saharan African average. The 2020 edition of “Doing Business” ranks Lesotho 84 out of the 190 with a score of 88.2 out of 100 for the ease of starting a business. Figure 3 provides the ranking and scores of Lesotho to other economies for various “Doing Business” topics, showing areas where Lesotho is performing well and those that need to be improved. Contracting, protecting minority investors and access to electricity are areas of weakness for Lesotho which negatively impact doing business, while trade across the borders and getting credit have shown to be areas of strength.

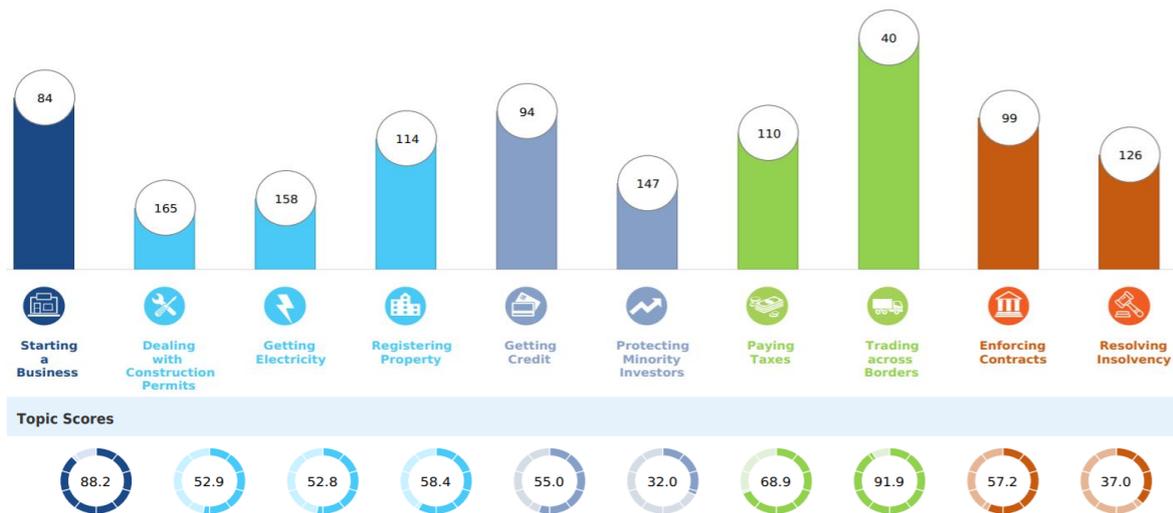


Figure 3: World Bank Doing Business 2020 global rankings and scores for various “Doing Business” topics in Lesotho. Source: World Bank Group, 2020

## Energy

Lesotho’s energy vision is described in the country’s Energy Policy 2015-2025. This states that ‘Energy shall be universally accessible and affordable in a sustainable manner, with minimal negative impact on the environment’. The policy includes 15 policy statements to achieve its vision, articulated through four main goals:

- Contributing towards the improvement of livelihoods
- Contributing towards economic growth and investment
- Ensuring security of supply
- Contributing towards the protection of the environment

Additionally, the energy policy provides a strategy for the energy sector which aims to achieve the goals articulated in the National Strategic Development Plan (NSDP). However, it must be noted that these NSDP goals have not been formally adopted, creating uncertainty over the status and plan for the sector. A draft renewable energy framework policy has also been developed that includes mechanisms for procuring off-grid and on-grid renewable energy, but this too has not yet been adopted, adding to the development uncertainty.

The production of energy in Lesotho is among the greenest in the world, with nearly all of its installed capacity located at the 72 MW Muela Hydropower Plant. Imports from South Africa (Eskom within the Southern African Power Pool) and Mozambique (Electricidade de Mocambique, approximately 60% of imports) account for approximately 50% of the electricity consumption as the demand for electricity exceeds the local generation.

At present, the country's average power demand is around 145 MW and is expected to grow to approximately 200 MW in the near future as a result of proposed new industrialization plans meant to drive private sector jobs. Furthermore, Lesotho set itself a renewable source electrification rate target of 35% in rural areas by 2020. It is unclear whether this has been met, however.

Given a relatively low average electrification rate (33.7%) there is still a huge dependence on biomass fuel which contributes 66% of primary energy needs (cooking, lighting and space heating) for the country's rural poor majority (approximately 60% of the population). The remaining 34% consists of imported petroleum products, hydroelectricity, coal and Liquid Petroleum Gas (LPG).

The collection of biomass for energy needs is done almost exclusively by women and children, having a significant negative impact on women-led economic development and entrepreneurship, education and health in rural Lesotho. Additionally, these practices have direct and indirect impacts on ecosystem services, exacerbating an already vulnerable system, particularly from a climate change perspective.

Yet Lesotho has abundant renewable sources. It has been identified that Lesotho could potentially produce a further 450 MW in hydropower, 6000 MW from wind, and 4000 MW from pumped storage. Today, the country is only exploiting about 17% of this potential.

## Solar

Lesotho is endowed with a generous amount of sunshine, with most parts of the country getting 300 days of sunshine a year. As a result, the theoretical solar power reception in Lesotho is about 5.4 kWh/m<sup>2</sup> per day with 14% solar-to-electricity conversion efficiency via PV modules. This translates into usable energy of approximately 280 kWh/m<sup>2</sup>/yr. This is one of the highest annual solar radiation rates globally. However, the current installed capacity of solar is less than 1 MW.

Analysis from the Department of Energy has indicated that approximately 30% of rural households could afford solar PV if a financial credit mechanism were put in place to aid these purchases, suggesting that solar PV has a high potential for rural electrification through off-grid installations, especially where the topography of Lesotho makes grid extensions challenging.

## Wind

According to the Lesotho National Strategic Development Plan 2018/2019-2022/23, there is potential to generate over 6000 MW through wind, offering a potentially significant source of energy not only for Lesotho but also to sustain South Africa's increasing energy demands. However, technical challenges remain, as Lesotho's unique geography means increased risk of lightning strikes as well as icy winters, posing significant threats to efficiency and infrastructure integrity.

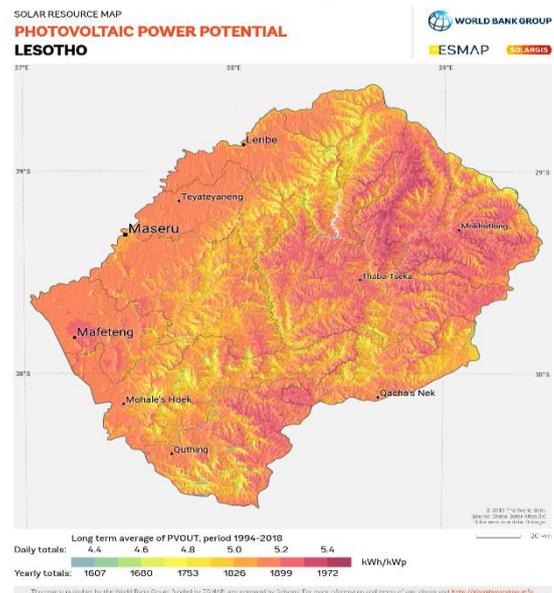


Figure 4: Solar Resource Lesotho. (2019 The World Bank, Source: Global Solar Atlas 2.0, Solar resource data: Solargis)

Furthermore, the eastern escarpment of Lesotho, bordering a UNESCO World Heritage Site, is well suited to wind energy yet is home to globally significant populations of vultures (critically endangered Bearded vulture and endangered Cape vulture). So while the potential for wind energy is great for many areas within Lesotho, these areas often coincide with challenges, and therefore limit where wind farms can be developed.

## Hydro

Hydropower development is centred around the Lesotho Highlands Water Project (LHWP) which is an ongoing water supply project with a hydropower component developed in partnership between the governments of Lesotho and South Africa. It comprises a system of several large dams and tunnels throughout Lesotho and delivers water to the Vaal River System in South Africa. It is also Africa's largest water transfer scheme. Phase one of the LHWP incorporated 72 MW of hydroelectric power while phase two, currently under construction, will incorporate further hydroelectric power of which capacity is still to be determined. However, as previously indicated, there is potential for Lesotho to generate approximately 450 MW.

With regards to small scale hydro, initially the Lesotho Energy Company had four small mini hydro-power stations in the mountainous areas of Semonkong, Mantšonyane, Tlokoeng (Mokhotlong) and Tsoelike (Qacha's Nek). However, Semonkong and Mantšonyane are the only stations operational. A further estimated 20-40 sites are available for exploitation with a combined potential of more than 20 MW.

Prevailing settlement patterns and distribution of hydrological resources are conducive to the development of a decentralised hydropower-driven energy system. However, an issue of concern which is the prevalence of drought, which is expected to occur more frequently due to climate change, and will limit operating capacity, with many units currently not operating at full capacity due to low water levels. This is exacerbated by high silt content in the rivers, further challenging the operation of these stations.

## Biomass

As noted earlier, Lesotho's energy balance is dominated by biomass energy that supplies the majority of rural households. The overwhelming reliance of rural households on this resource places enormous pressure on the forest resources of the country.

Alternative biomass-related energy, such as biogas, has been considered inappropriate for local rural populations, as water access needs to sustain this type of energy are difficult to meet from an infrastructure perspective. From a cultural perspective, rural populations find it much easier to rely on traditional methods of energy generation such as burning dung directly. Other complications have been observed during pilots, such as livestock theft, and low temperatures causing frost.

Overall, institutional and government support relating to developing alternative energy and efficient use is relatively limited and therefore, in the short to medium term, dependency on limited biomass resources will continue to grow.

Some of the main challenges within the energy sector are:

- Very low access to electricity
- Stagnant generation capacity with rising demand
- Import dependency from Mozambique and South Africa
- Weak policy and institutional framework lacking a holistic approach and incentives for private sector involvement
- Low awareness of renewable energy technologies and limited knowledge of potential resources

## Improved energy access and mini grid development

The World Bank and the International Development Association (IDA) are providing \$40 million in new financing and an additional \$12.9 million from the Scaling Up Renewable Energy Program (SREP) for the country's energy sector.

The SREP action plan consists of two key components:

- Component 1: On-grid RE technologies
- Component 2: Distributed RE solutions

The overall goal of the programme is to enable increased adoption of the priority technologies through the development of commercial on-grid and off-grid renewable energy (RE) markets.

The Lesotho Renewable Energy and Energy Access Project aims to expand access to electricity to diverse consumers with varied needs, including households in rural communities and in the outskirts of urban areas, small and medium enterprises and economic centres that are on or off the grid. The project will also provide technical assistance to build capacity of both public and private sectors to ensure sustainable provision of electricity in Lesotho.

Additionally, the project will support upgrading the Lesotho Electricity Corporation (LEC)'s hydro-based mini grid in Semonkong to provide additional connections to both household and commercial customers, as well as metering solutions for new and existing customers. It will also support grid extensions to commercial and industrial consumers located in the economic zones of Lesotho.

The project will facilitate the electrification of areas where supply through mini grids would be the least-cost option. In particular, the project will strengthen the legal and regulatory framework for the deployment of mini-grids and will help finance the construction of mini-grid infrastructure to provide electricity services to new users in up to 40 communities.

## Energy stakeholders and programmes

The Ministry of Energy and Meteorology through the Department of Energy is responsible for the overall administration and coordination of energy in Lesotho. The main energy stakeholders and their associated roles are described in Table 2. Lesotho energy-related support programmes are described in Table 3. These programmes illustrate the main project activities, aims and objectives within the country.

**Table 2: Overview of the main stakeholders in the energy sector within Lesotho**

Institution	Role
<b>Department of Energy</b>	Policy, plans, strategy, programme formulation, enforcement and information dissemination.
<b>Petroleum Fund</b>	Funding viable energy projects as well as research and development in the petroleum sector.
<b>Lesotho Electricity Authority</b>	Electricity sector regulation.
<b>Lesotho Electricity Generation Authority</b>	Development and management of electricity generation projects for electricity supply to Lesotho.
<b>Lesotho Electricity Company</b>	Electricity transmission, distribution and supply in urban and financially viable areas of the country.
<b>Lesotho Electrification Unit</b>	Building the operation and transfer of electricity transmission, distribution and supply networks, and management of the National Rural Electrification Fund (NREF).
<b>Appropriate Technology Services</b>	Technology development.

**Table 3: Support programmes in Southern Africa applicable to Lesotho**

Programme	Main activities
<b>Lesotho Renewable Energy and Energy Access Project</b>	The project objective is to increase access to electricity in rural and peri-urban areas of Lesotho and is a loan under the Strategic Climate Fund (SCF of the World Bank) of US \$8 million.

Table 3: Support programmes in Southern Africa applicable to Lesotho

<b>EEP Africa - Energy and Environment Partnership</b>	<p><b>NalaPAYGo</b> is piloting pay-as-you-go (PAYG) sales of solar home systems (SHS) in Lesotho to improve access to clean renewable energy products. There is a significant gap in the market regarding rural last mile distribution of SHS and other high impact and affordable products and services. With EEP Africa financing, NALA will establish a national distribution and service support network in an underdeveloped market. The aim of the project is to enhance access to modern energy for over 20,000 people through the establishment of a national distribution network for PAYG SHS. Within the next five years, Nala aims to establish a last mile distribution and service presence in all rural areas of Lesotho, reaching over 250,000 people.</p> <p><b>African Clean Energy</b> is a social enterprise that produces and distributes solar-biomass hybrid energy systems (the ACE ONE Energy System) in developing countries. Lesotho is ACE's home market since 2014, with ACE headquarters in Maseru. The ACE One is sold direct to consumers in using an instalment-based payment model at a cost of about \$100 each. To date, the company has sold about 60,000 units and has a potential market of approximately 900 million households worldwide. ACE is currently expanding its mobile retail shops to give more people access to its products and services, in a project which is being co-funded by the European Union.</p>
<b>Strategic Climate Fund - Scaling Up Renewable Energy Program (SREP)</b>	<p>The SREP (through the Climate investment fund) is a global program to manage the challenges of climate change and reduce their greenhouse gas emissions. The programme provides concessional resources to scale up low carbon technologies in renewable energy, energy efficiency, and sustainable transport for increased energy access and economic growth in the world's poorest countries. Lesotho has developed a SREP investment plan to enable increased adoption of the priority technologies—wind, solar, small hydropower—through the development of commercial on-grid and off-grid renewable energy markets. SREP funds will be used to facilitate private investment with support to the first privately funded renewable energy projects and provision of technical assistance to develop missing pieces of the enabling environment.</p>
<b>Southern African Solar Thermal Training and Demonstration Initiative (SolTrain)</b>	<p>SolTrain is a Regional Project in Southern Africa that assists local institutions in improving the efficiency and quality of their solar systems and in building maintenance capacity. In Lesotho, it is implemented through the vocational school Bethel Business and Community Development Centre (BBCDC). This institution has taken the lead in harnessing solar energy and teaching solar energy utilisation as a core curriculum component. BBCDC also operates a</p>

Table 3: Support programmes in Southern Africa applicable to Lesotho

	full-fledged energy services sales division which includes photovoltaics (PV) and solar water heating along with comprehensive construction solutions.
<b>Clean Cooking Alliance</b>	The goal of this global project is to create a thriving global market for clean and efficient household cooking solutions in order to save lives, improve livelihoods, empower women, and protect the environment. Lesotho is a country partner, so its government has ascribed to the principles of the Clean Cooking Alliance.
<b>11th European Development Fund. National Indicative Programme (NIP) 2014-2020</b>	The overall objective for this bilateral cooperation in the energy sector is to provide Lesotho's people and productive sectors with access to a modern, clean, affordable, sustainable and reliable energy supply. The specific objectives leading to this overall goal consistent with the NSDP are effective and sustainable governance of the energy sector at the national level, and a more sustainable, cleaner energy sector providing universal access to modern, affordable and reliable energy with a reduced reliance on biomass. As budget support was discontinued in 2017, bilateral cooperation with Lesotho is mainly implemented through a project approach and blending operations. The initial envelope of €142 million was reduced to €124 million after a mid-term review.
<b>Southern African Sustainable Energy Initiative</b>	A regional project focused on developing capacity in the Higher Education Institutions of partner countries for national and regional planning, development and implementation of sustainable energy systems and projects. It is coordinated by the Namibia University of Science and Technology, in partnership with the University of Lesotho, University of Botswana and Hochschule Darmstadt in Germany.

## Industry associations

Three industry associations are active in Lesotho:

**The Lesotho Council of Non-Governmental Organisations (LCN)** is an umbrella organisation for NGOs providing supportive services. The Council implements support through networking, information dissemination, capacity building, coordination, leadership training and development with the government and the international community.

**Lesotho Solar Energy Society** acts as a platform for the industry and clean energy expert groups to exchange information and implementation of an industry code of practice.

**Lesotho Association of Engineers** seeks to foster and promote engineering and its application in Lesotho and to facilitate the exchange of information. The association cooperates with educational institutions and public educational authorities for the furtherance of education and training in engineering science and practice.

## References and further reading

### Lesotho Energy Policy 2015-2025

[https://www.solarthermalworld.org/sites/gstec/files/news/file/2016-03-10/lesotho\\_energy\\_policy\\_.pdf](https://www.solarthermalworld.org/sites/gstec/files/news/file/2016-03-10/lesotho_energy_policy_.pdf)

### National Strategic Development Plan 2018/19-2022/23

<https://www.undp.org/content/dam/lesotho/docs/Reports/NSDP%20II%202019-2023.pdf>

### Solar Resource and PV Potential of Lesotho: Solar Resource Atlas

<https://globalsolaratlas.info/download/lesotho>

### Rapid Assessment and Gap Analysis for Lesotho Sustainable Energy for All

<https://www.seforall.org/>

### Lesotho SREP Investment Plan

[https://www.climateinvestmentfunds.org/sites/cif\\_enc/files/srep\\_investment\\_plan\\_lesotho.pdf](https://www.climateinvestmentfunds.org/sites/cif_enc/files/srep_investment_plan_lesotho.pdf)

### World Bank renewable energy and energy access project

<https://projects.worldbank.org/en/projects-operations/project-detail/P166936>

### Doing Business

<https://www.doingbusiness.org/content/dam/doingBusiness/country/l/lesotho/LSO.pdf>

### Lesotho Bureau of Statistics

<http://www.bos.gov.ls/default.htm>

### Lesotho Highlands Development Authority

<http://www.lhda.org.ls/lhdaweb>

### Lesotho Electricity Company

<https://www.lec.co.ls/>

### Official UK Government travel advice for Lesotho

<https://www.gov.uk/foreign-travel-advice/lesotho>

## Useful contacts

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