

Country Assessment Report

Country/Region name:

Namibia is situated in Southern Africa and has a population of approximately 2.3 million people. It is estimated that by 2022, the country's population will increase to 2.44 million inhabitants. The state capital, Windhoek, is the most populous city in Namibia by far. The nation has a GDP worth \$12.367 billion, with an annual growth rate of -1.134%.

(Statista 2018; World Bank 2019)

Economic structure and activity:

The largest economic sector is the service industry, which accounts for more than half of the country's GDP. The mining industry strongly contributes to Namibia's GDP, the state being one of the major countries to contribute to the production of uranium and diamonds globally. In 2016, Namibia produced 3,315 metric tons of uranium, and in 2015, it produced 8.7 percent share of the total value of diamonds produced worldwide, making these two industries the most profitable ones among the mining industries in the country. In 2016, Namibia also exported goods worth about 4.08 billion U.S. dollars, and imported goods worth approximately 6.84 billion U.S. dollars. Over the last decade, Namibia has reported a trade deficit, which reached its peak in 2014. As of 2016, Namibia's trade is still in the red, but recovering slowly.

Generation and demand: (type, MW, TWh)

Namibia's installed capacity is mainly renewable, with hydro accounting over half of available resources with and fossil fuels fuel contributing making up over a quarter of supplies (see Table 1). In 2018, electricity generation was dominated by hydro and marine energy, having contributed 77% of the nation's total supply. Solar generation expanded to account for 13%, shortly followed by fossil fuels (9%) and wind (1%). Observing all energy types, solar is showing the most rapid signs of growth, with a net capacity change of 47% in the year 2019 from the previous year.

Installed Capacity	MW	%
Non-renewable	183	27
Renewable	487	73
Hydro/marine	347	52
Solar	135	20
Wind	5	1
Total	671	100

Table 1. Installed Capacity (2019).

Generation (2018)	GWh	%
Non-renewable	133	9
Renewable	1284	73
Hydro/marine	1086	77
Solar	180	13
Wind	18	1
Total	1416	100

Table 2. Generation Mix (2018).

(IRENA 2019)

The installed electrical generation capacity is insufficient to meet the demand for electricity. Therefore, Namibia is importing large amounts of electricity from neighbouring countries mainly South-Africa (through 2x220 kV & 400 kV connections). The cross-border transmission lines also include 2010-completed Caprivi Link Interconnector HVDC, a 300MW capacity DC transmission scheme linking the NamPower network to the ZESCO transmission system in Zambia, also providing the first and only connection of the Zambezi region to the main transmission grid of Namibia.

Demand Side Management is one of Nampower's priority projects aiming to cost effectively address the electricity supply constraints by reducing electricity demand on the Namibian network during peak times through the implementation of energy efficient and renewable energy technologies, including the following initiatives:

- 1 million Light Emitting Diode (1mLED) Campaign
- 20,000 Solar Water Heater (20kSWH) Campaign
- Virtual Power Station (VPS) and Demand Reduction (DR) campaign

RE Market Potential:

Namibia is well endowed with RE potential. In fact, is the world's second highest solar irradiation regime, with the entire country having radiation of more than 5.5 kWh/m²/day, and sizeable regions having levels as high as 5.8 kWh/m²/day or greater. It has high wind power potential, especially in coastal areas where wind speeds reach 10 m/s or faster. Namibia is home to several hot springs, indicating the potential for geothermal energy development. Furthermore, Namibia is uniquely placed to transform the challenge of an invasive plant species (encroacher bush) into an opportunity for biomass-based energy, with large areas that have the potential to generate between 6-30 MWh/hectare from conversion of bush into bioenergy (or up to 40 TWh/acre, according to some assessments). This is in addition to Namibia's hydropower potential on the Kunene, Kavango, and Orange Rivers, as noted in the Hydropower Master Plan.

([https://ecb.org.na/images/docs/Noticeboard/National%20Renewable%20Energy%20Policy%20for%20Namibia_DRAFT%20\(June%202013\).pdf](https://ecb.org.na/images/docs/Noticeboard/National%20Renewable%20Energy%20Policy%20for%20Namibia_DRAFT%20(June%202013).pdf))

Electrical interconnection and import/export:

Namibia can partly provide itself with self-produced energy. The total production of all electrical energy producing facilities is 1 million MWh. That represents 36% of the country's own usage. The rest of the needed energy is imported from neighbouring countries. Namibia is a member of the Southern Africa Power Pool (SAPP) and has electrical interconnection with South Africa, Zambia, Zambia and Botswana. There are also plans to build a 400kV interconnector with Angola which would transmit electricity from Southern Angola to the Northwest of Namibia.

Namibia is becoming increasingly reliant on foreign imports of energy and will look to diversify its capacity by harnessing its renewable resources to meet growing demand.

Source: <https://www.au-pida.org/view-project/730/>

Historical support or development of renewables in the country/region:

At present, only a third of all Namibians have access to modern electricity. There is even more troubling disparity between rural and urban electrification rates, with an estimated 78% of urban residents having access to electricity but only 34% with access in rural areas. According to the 2011 National Population and Housing Census, the use of grid electricity for lighting in rural areas is even lower, at 16%. The Government of Namibia is responsible for extending affordable, modern energy services to a greater percentage of Namibia's population. One of the objectives of the National Renewable Energy Policy is to make Renewable Energy a means of accelerating expanded energy access providing assurance of adequate and affordable energy services to the vast majority of Namibians, aiming for no less than 70% coverage by 2020 and near-universal coverage by 2030. Equally critical is the affordability of electricity in Namibia; the Policy aims to contain increases in costs of electricity in Namibia, to help reduce costs of living and doing business in Namibia.

http://www.mme.gov.na/files/publications/03f_National%20Renewable%20Energy%20Policy%20-%20July%202017.pdf

Electricity market structure:

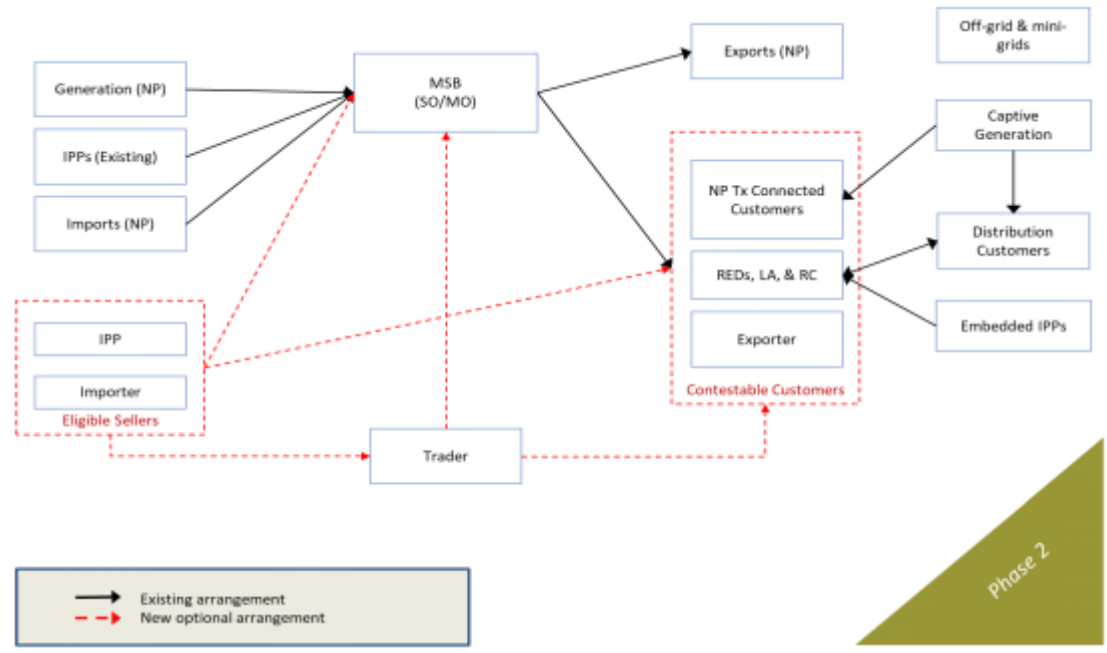
The historical electricity market structure is that of a vertically integrated single buyer whereby NamPower's Electricity Trading Unit buys electricity from suppliers through long-term PPAs. Only NamPower was allowed to buy power from Generators – with a few exceptions (some Embedded Generators connected to distribution licensees, self or Captive Generation, off-grid mini-grids).

A Modified Single Buyer (MSB) market model has been effective as of 01 September 2019, a further step by Namibia towards greater competition in the electricity industry:

- The MSB allows some electricity consumers and Independent Power Producers (IPPs) to transact with each other directly for the supply of a certain portion of their electricity requirements.
- To participate in the new market structure, eligible customers need to be designated as “Contestable Customers” and sellers (Generators) need to be designated as “Eligible Sellers”.
- Contestable Customers will need to register with the ECB and NamPower for their contestable quantity, while Eligible Sellers will need to comply with ECB licensing requirements and the MSB rules.

Whereas Phase 1 is concerned with supporting the development of new supply options within Namibia, Phase 2 allows for imports, into Namibia.

Figure - MSB Phase 2 Trading Arrangements



[https://www.ecb.org.na/images/docs/Investor_Portal/Procurement Mechanisms for RE Energy Sources.pdf](https://www.ecb.org.na/images/docs/Investor_Portal/Procurement_Mechanisms_for_RE_Energy_Sources.pdf)

The Namibian electricity sector serves some 230 000 grid-connected customers. In 2016, the country recorded a system peak demand of 608MW, and NamPower sold some 3.3TWh of electrical energy in Namibia. In the same year, the total installed generation capacity, as reported by NamPower, amounted to 493MW, excluding IPPs and customer-installed and embedded generation facilities.

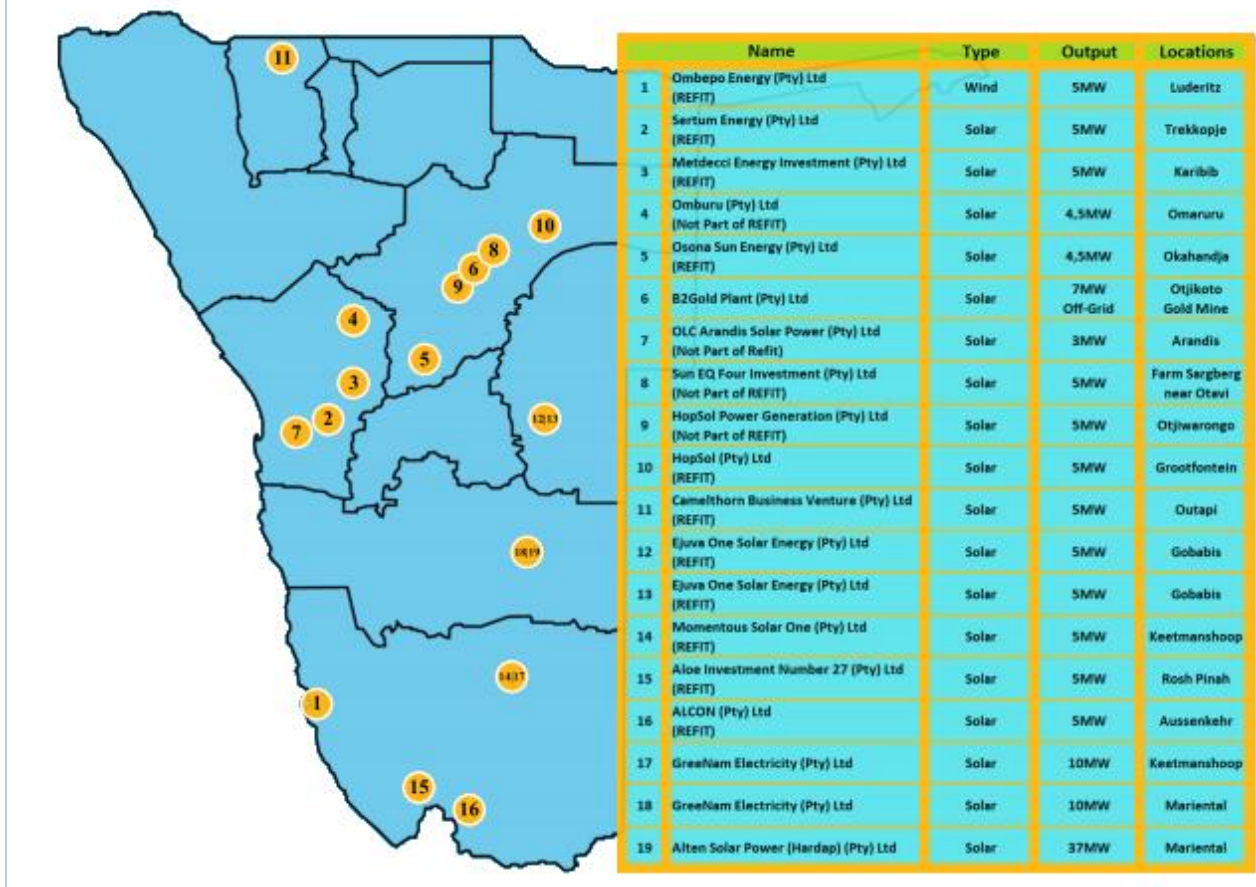
Description of renewables support mechanism:

Despite its ambitious renewable energy targets, a lack of policy incentives has hindered Namibia’s realisation of its vast renewable potential. However, a REFiT for renewable energy was introduced in 2015 for biomass, solar PV and wind projects with a capacity between 500kW and 5MW (expected to generate up to 70 MW of energy). Since then, 19 such power purchase agreements, including 14 REFiT projects, have been finished with IPPs, so that by the end of 2020 around 175 MW renewable energy capacity were being connected to the grid. The majority of these projects have been photovoltaics, but also includes 50 MW wind power and 40 MW from biomass power plants.

A study by Amesho and Edoun on renewable energy financing in Namibia found cases in other developing countries where renewable markets grew enigmatically where advanced financial markets were present and where external financial support was actively encouraged¹. Yet the banking sector in Namibia is well-developed and access to credit financing is possible. Similarly, financiers are showing an increased interest in renewable energy projects and a few banks have already financed REFiT projects.

(IEA 2021)

Figure – Map of Renewable Energy Plants in Namibia



¹ Amesho, K.T. and E. I. Edoun. (2019) Financing Renewable Energy in Namibia-A Fundamental Key Challenge to the Sustainable Development Goal 7: Ensuring Access to Affordable, Reliable, Sustainable and Modern Energy for All. *International Journal of Energy Economics and Policy*, 9(5), p.442.

(Electricity Control Board, 2019)

Other renewable energy programmes implemented with Developmental Partners included:

- Namibian Renewable Energy Programme (NAMREP) Phase I (2004-2007) and Phase II (2007-2010), co-funded by the Global Energy Facility (GEF) and supported by United Nations Development Programme (UNDP)
- Namibia Energy Efficiency Programme in Buildings (NEEP)(2010-2014), co-funded by GEF and supported by UNDP
- Concentrated Solar Power Technology Transfer for Power Generation in Namibia (CSP TT NAM) programme (2014-2017), co-funded by GEF and supported by UNDP
- Off-grid Energization Master Plan (OGEMP), an initiative that promotes the use of renewable energy for households not connected to the grid (2007)

Responsible government department: (include key contacts)

The Ministry of Mines and Energy (MME) is the State's lead agency in attracting private investment in both resource exploration and development, through the provision of geoscientific information on minerals and energy resources, and management of an equitable and secure titles systems for the mining, petroleum and geothermal industries.

It also carries prime responsibility for regulating these extractive industries and dangerous goods in the country, including the collection of royalties, and ensuring that safety; health and environmental standards are consistent with the relevant State and Commonwealth legislation, regulations and policies.

Existing/Planned energy legislation: (is there a CPO)

The Electricity Act (2007) introduced to enforce regulation over the electricity sector and establish the provision of powers by ECB (Electricity Control Board) and its functions.

Environmental legislation for RE:

The complexity of Namibia's energy sector – and the central role of energy in supporting broader national development – manifests in a multiplicity of policy documents and frameworks that touch on themes relevant to the National Renewable Energy Policy. The government views alignment between the different instruments as critical. Thus, this policy has been drafted after a review of numerous such policies, strategies, vision documents, and frameworks, and is (at present) consistent with what they articulate. These include, but are not limited to:

- The Harambee Prosperity Plan, 2016
- Namibia Vision 2030
- Namibia's Fourth National Development Plan (NDP-4), 2012/13 – 2016/17
- The White Paper on Energy Policy 1998
- National Integrated Resource Plan, 2016
- Rural Electricity Distribution Master Plan, 2010

- Off-Grid Energization Master Plan, 2007
- National Connection Charge Policy, 2015
- National Policy on Climate Change, 2011
- Namibia's Intended Nationally Determined Contribution to the UNFCCC, 2015

Existing/Planned energy certificate systems: (purpose, extent)

There are no existing or planned energy certificate schemes in Namibia so I-RECs will not conflict with any current systems.

Extent of engagement with government:

Initial contacts have been established with:

- Environmental Investments Fund of Namibia. They drive the environmental tech industry and current formulating policies around green energy on behalf of government
[REDACTED]
- Ministry of Environment, Forestry and Tourism
- Environmental Commissioner's office / CDM-DNA of Namibia
[REDACTED]

Response from Government in relation to attribute tracking systems:

The I-REC Foundation Board has received a no-objection letter from the Executive Director of the Ministry of Environment, Forestry and Tourism, [REDACTED], for the introduction of I-REC to Namibia. The Ministry recognises the instrumental role EACs can play in encouraging the growth of renewable energy in Namibia.

Demand-side market potential or strategic nature of market development:

At the policy level, Namibia's Nationally Determined Contributions (NDC) report include that "measures contributing to mitigation in the energy sector will be to increase the share of renewals in electricity production from 33% to 70% by 2030".

In the private sector field, multiple multinational organisations associated with RE100 are based in Namibia including Deloitte and PwC.

There are also hospitality companies such as Hilton who aspire to claim renewable energy consumption in their supply chain to limit their carbon footprint, also likely to put further pressure on the industry to claim for RECs. Namibia hosted the fifth Global Partnership for Sustainable Tourism [GPST] conference in 2015, which encourages the healthy balance of sustainability and tourism and credited Namibia as becoming one of the world's leading sustainable tourism destinations. Last but not least, Bank Windhoek on 2 June 2021 launched Namibia's first Sustainability Bond, with which the Bank obtained alternative sources of funding to the value of N\$227 million on a private placement basis.

Analysis of political disruptions or market risks:

Namibia has enjoyed political stability for some time and there are no significant risks or disruptions that could impact the renewable energy market and its continued development.

There are barriers to renewable energy development in Namibia, including public awareness, technical know-how, cost, intermittency, and optimization. These barriers are typical of any developing renewable energy market and can be managed through education programs, knowledge transfer, favourable regulatory and incentive frameworks, and diversification of energy resources.

Analysis of regulatory risks including linkages with carbon markets and support systems:

The electricity market is regulated by the Electricity Control Board (ECB) which has a specific branch for renewable energy. Environmental issues are managed by the ECC (Environmental Compliance Consultancy) which issues to all electricity producers the ECC (Environmental Compliance Certificate) based on the environmental impact assessment of each project to be renewed every 3 years, which does not suggest any conflict whatsoever between the I-REC and the current carbon market, provided both may include country's profit-sharing obligation and be fully & transparently accountable internationally.

Current environmental reporting in energy:

Minister of Mines & Energy is responsible for environmental reporting in the energy sector.

Mechanisms in place to support the reliable verification and issuance of I-RECs:

Billing is done on the basis of NamPower's metering system and reconciled readings. Any IPP will therefore be able to transmit the count of its SPV issued by NamPower. Aggregated public records of electricity output are available on the Nampower website² to support the reliable verification and issuance of I-RECs for GCC and future issuers.

Local organizations of importance and their opinion on local I-REC market development:

In March 2021, Aera Group initiated development of the Namibia Country Assessment after registering potential demand for I-RECs. Aera Group are the largest originator and trader of environmental attribute certificates in Africa and currently operate in the I-REC Market within Uganda.

Any other relevant information:

- NamPower <http://www.nampower.com.na>
- Electricity Control Board <http://www.ecb.org.na/>
- Ministry of Mines and Energy <http://www.mme.gov.na/energy/electricit>

² <https://www.nampower.com.na/Media.aspx?m=Annual+Reports>
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• Renewable Energy & Energy Efficiency Institute	http://www.reeci.org.na/index.php
• Erongo RED	http://erongored.com/
• Cenored	http://www.cenored.com.na/

Report Prepared by	AERA Group
Contributors	[REDACTED]
Preparation Date	05/10/2021