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NDCs, Critical Minerals & Climate Justice Series

NAMIBIA: NATIONALLY DETERMINED CONTRIBUTIONS, CRITICAL MINERALS AND JUST ENERGY TRANSITION

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INTRODUCTION

Namibia is vulnerable to adverse impacts of climate change. Its climate is characterised by extreme weather conditions that include droughts and flooding. It is also a solution country in that it has huge deposits of critical minerals for the global energy transition. In this policy brief, Namibia's nationally determined contribution (NDC) is discussed from a critical mineral and just energy transition point of view.

Namibia's Mining Sector and the role of Critical Minerals for the Energy Transition

Namibia's mining sector is a vital component of its economy, contributing about 10 per cent of the country's annual gross domestic product (GDP). Diamond mining, led by key players like NamDeb and Debmarine Namibia, has historically contributed a significant portion of the country's trade in commodities and export revenue. However, this situation is changing with other minerals being discovered.

Cobalt and lithium production has also placed Namibia as a supplier of transition minerals for the manufacture of green technologies. The Omaruru Lithium Project has reported prospect lithium resources in Namibia, which is one of the key critical minerals in battery manufacturing.[1] Namibia is emerging as a source of critical minerals such as cobalt and lithium, crucial for renewable energy technologies. The country has also revealed a substantial find of rare earth elements (REEs) in 2022, seeking partnerships with investors from the United States of America (USA). The nation is a prominent zinc producer, with mines including Skorpion Zinc and Rosh Pinah. Zinc is a key component in various types of batteries, including zinc-carbon batteries and alkaline batteries. These batteries are commonly used in electronic devices, remote controls, and other portable electronics. Due to underdeveloped domestic capital markets, the Namibian government is actively inviting foreign direct investment (FDI) to advance and modernise its mining industry.

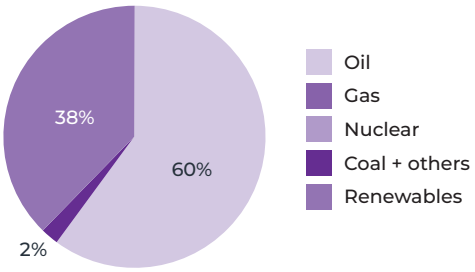
Namibia is the world's third largest producer of uranium oxide after Kazakhstan and Canada. It has mines such as Husab and Rossing Uranium, which is operated by China General Nuclear Power Group. This places Namibia as a key supplier of raw materials for the nuclear industry. Whilst Namibia does not have any specific policy against going nuclear for its electricity generation, there also is no mention of this option. In addition to the metals, Namibia has abundant water resources to produce green hydrogen, which is emerging as the cleanest alternative in the global green energy transition.

Although mining in Namibia has contributed to economic development, revenue generation, and skills development for local employees, it has had negative impacts on the environment and on local communities. The expansion of mining activities in the Omaheke region has displaced traditional pastoralist communities, who rely on grazing land for their livestock.[2] The Husab uranium mine, operated by Paladin Energy, has been criticised for its impact on the local environment, including water contamination and air pollution.[3] The Ombenje and Kunene Region in north-western Namibia copper mine projects, operated by China Africa Minerals, has been the subject of protests from local communities concerned about the potential environmental and social impacts of the project.[4] Some mining companies in Namibia have been accused of employing workers in unsafe conditions and failing to provide them with adequate safety training. The question is whether the rise in the demand for critical minerals will reproduce these negative social and environmental impacts. The calls for a just energy transition require responsible sourcing of critical raw materials used as feedstock for renewable energy technologies.

Energy Mix and Options

Namibia's total energy mix is composed of 60 per cent oil, 38 per cent renewables (including hydro, biomass and solar), and 2 per cent coal.

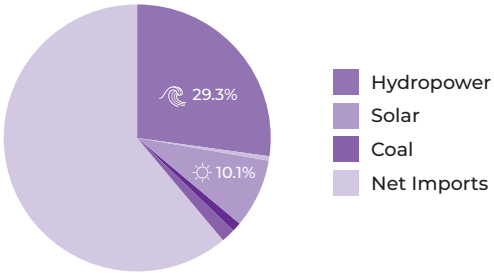
Total energy supply in 2020



Whilst there is great potential for nuclear energy, this debate is not part of the country's energy policy discussions. Can Namibia enrich its uranium resources for electricity generation and gain a degree of energy security and independence? There are no answers to this question at the moment.

The domestic share of Namibia's electricity comes from hydropower, coal, heavy fuel oil, solar and wind.[5] While Namibia continues to increase its local generation of electricity, particularly from renewable energy resources, imports still form the mainstay.[6] In 2019, electricity imports totalled 70 per cent due to a significant drop in local generation in part because of the impact of the drought on its Ruacana Hydro Plant.[7]

Electricity Consumption: Electricity (2021)
Source: Low Carbon Power (2023)



Namibia has some of the highest solar photovoltaic (PV) and concentrated solar power (CSP) potential in the world.[8]

About 200 MW of solar photovoltaics feed electricity into Namibia's national grid, contributing 8.58 per cent of total electricity consumed nationally and approximately 26 per cent of local generation.[9] There are clear indications that new energy storage will soon be incorporated into the national grid for use by NamPower to store energy and support increased penetration of renewable energy systems.[10] In 2022, Namibia's national electricity demand was 3983 Gigawatt hours (GWh) with a peak demand of 637 Megawatt (MW).[11] Ministerial growth projections in the National Integrated Resource Plan (NIRP) are 5300 GWh and 900MW peak by 2028.[12]

Namibia clearly has several energy alternatives that it can choose for a low-carbon energy future. In its NDC Otjikoto Biomass Power Project is listed as a good example of the country's potential use of biomass for electricity generation. The proposed plant has the potential to provide 40 MW of electricity to the grid.[13] Further enhancement of Namibia's wind potential is expected. Not only can wind generation be used to produce electricity for the national grid, but these resources can also power the required desalination facilities that will provide the water for green hydrogen production and also desalinate water for potable water use and agricultural production.[14]

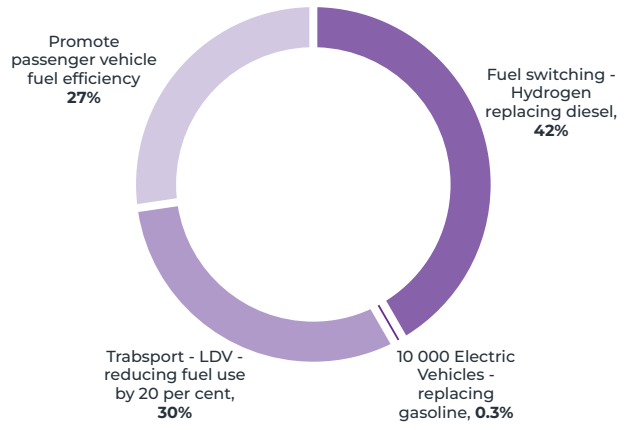
Energy poverty disproportionately affects women and girls who must find alternative heating and lighting means in undertaking household chores.

It is important to note that energy poverty is high in Namibia. About half of the population has no access to electricity. Energy poverty disproportionately affects women and girls who bear the burden of finding alternative means in undertaking household chores such as heating and lighting. With a high rate of unemployment (about 20.8 percent), there is a need for solutions to make energy more accessible, especially to off-grid rural communities.

The Namibian Climate Response and Action

In its 2021 updated NDC, Namibia has taken a major step to raise its mitigation ambition from 89 percent in 2015 to 91 per cent by 2030. It makes a commitment to reduce its GHG emissions conditionally by 14 per cent (under limited domestic and international support), and towards 77 per cent (with substantial international support) in 2030 compared to the business-as-usual levels. This ambition corresponds to a total reduction of GHG emissions by 21.996 $MtCO_2e$. Considering that the transport sector pollutes the environment heavily, the Namibian government in its updated NDC proposed steps to reduce fossil fuel consumption in the transport sector by commissioning a mass transport system in Windhoek to reduce the number of cars by about 40 per cent, implementing a car-pooling system, and improving freight transportation to reduce the number of light-load vehicles by about 20 per cent.[15]

Mitigation Potential: Transport Sector
Source: Namibia NDC 2021



Namibia also intends to introduce electric vehicles and start replacing gasoline in line with global trends. What is significant is the role that hydrogen will play in the energy transition. Fuel switching with hydrogen replacing diesel is expected to result in hydrogen taking a 42 per cent share of the transport sector fuels.

In respect of electricity generation, Namibia has set targets to increase the share of renewable energy in its energy mix. Namibia has provided incentives for investments in renewable energy. These include competitive prices for utility-scale solar PV independent power projects (IPPs) procured through auction programmes.[16] In September 2019, Namibia adopted the "Modified Single Buyer Framework," which allows independent power producers to directly sell electricity to large power users locally and internationally across the national transmission grid.[17]

The Ministry of Mines and Energy under the Off-grid Energization Master Plan (OGEMP) is electrifying government institutions such as schools, police stations, and clinics which are situated in off-grid localities using containerised photovoltaic (PV) systems.[18] These efforts are fundamental in Namibia's energy transition. Green jobs are being created and more are expected.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The African nation aiming to be a hydrogen superpower

"For a town that's really been struggling economically over the past 10 or 15, maybe longer, years, this is something that people are really very excited about," he says.

The project will be based near the town in the **Tsau //Khaeb National Park**, and ultimately produce around 300,000 tonnes of green hydrogen per year.

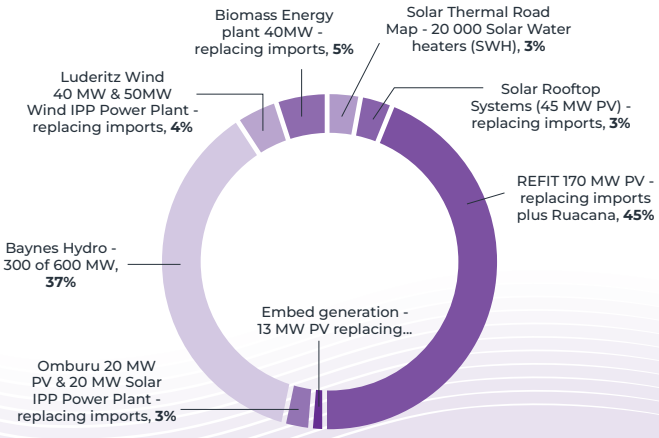
In simple terms, the renewable energy from the sun and wind will be used to separate hydrogen molecules from desalinated water.

Those hydrogen molecules in their pure form or in derivative green ammonia can make up a variety of products, including sustainable fuels.

The preferred bidder, Hyphen Hydrogen Energy, is set to start production in 2026 and will have the rights to the project for 40 years, once the necessary feasibility processes are concluded.

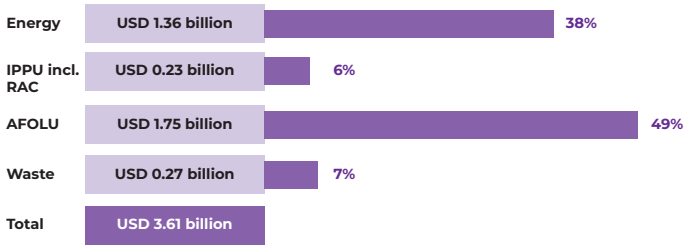
The firm says the four years of construction are likely to create 15,000 direct jobs and 3,000 more during full operations - and that 90% of them will be filled by locals.

Mitigation Potential and Energy Transition: Electricity Pool
Source: Namibia NDC 2021



Mobilising Climate Finance

Namibia estimates that $3.61 billion in funding is required for any identified mitigation options by 2030.[19] This means a fair blend of national and foreign funds will be critically needed. International climate financing sources will provide the large-scale investment needed. Strengthening finance from domestic and external sources will also be key in supporting the implementation of the mitigation and adaptation actions. The following is a sectoral presentation of cost estimates to support Namibia's NDC.



National policies can aid Namibia to shift investments and financial flows made by private and public investors into more climate-friendly alternatives and optimise the use of available funds by spreading the risk across private and public investors. It will be necessary to secure substantial funding to implement a sustainable pathway, especially as Namibia needs a lot more energy to power its development.

During the COP27 summit Namibia secured over 540 million euros ($544 million) in climate finance pledges from the Dutch government and European Investment Bank.[20] On the eve of the Global Gateway Forum, the European Union Commission President Ursula von der Leyen and President of Namibia Hage Geingob endorsed the roadmap for the EU–Namibia strategic partnership on sustainable raw materials value chains and renewable hydrogen.[21] According to the parties to the deal, an amount of €1 billion in investments will be mobilised by the EU, its Member States including Germany, Netherlands, France, Belgium and Finland and European financial institutions. Furthermore, the EU pledged to to support a study for the development of the Port of Walvis Bay to transform it into an industrial and logistics hub for the Southern African region.[22] The pledge is to support Namibia's green transition.

President of Namibia Hage Geingob said: "Namibia recognises that its world-class renewable energy resources provide a strong foundation upon which we will build a sustainable and impactful green industrial base. Namibia is also cognisant that to fully capture the opportunity at hand, we will have to mobilise fit for purpose capital that appropriately prices risk in order to optimise the cost of said capital. This is a key element that will form the cornerstone of this transformative partnership with the EU."

President of Namibia Hage Geingob (24 October 2023, EU Gateway Forum.)

Domestically, the Development Bank of Namibia (DBN) is a key arranger of climate finance. Namibia also receives funding from the Global Environment Facility and other local private institutions who contribute through their ESG initiatives. But it is through value addition and creating a domestic renewable energy sector that Namibia can increase its domestic resource mobilisation capacity.

The NDC states that it has a coordinated partnership approach to finance its climate action agenda. To this end, several members of the NDC partnership have already pledged to support Namibia's ambitions through the Partnership Plan. These include the African Development Bank, the Food and Agriculture Organization of the United Nations, the French Development Agency (AfD), the European Commission, the Federal Republic of Germany, the UNDP, the World Bank and World Resources Institute. Several Namibian banks, including the Namibia Development Bank and NedBank, have shown strong interest in investing in climate-smart projects.

Namibia's NDC undertakes to implement community-based projects

to build resilience to climate change. By increasing resilience against climate-induced land degradation, this will increase the scope of a just transition that offers social and environmental protection against climate loss and damage.

Policy Recommendations

The following policy recommendations are not exhaustive and serve to highlight major issues for policy attention.

- ***Invest in value addition initiatives***

Namibia, as a country with rich critical mineral resources, such as lithium, cobalt, zinc and rare earth elements, has the potential to strategically leverage these resources by encouraging investments in industrial processes that enhance their value. Because of lithium reserves, for example, Namibia can position itself as a potential hub to produce advanced energy storage technologies. This aligns with global trends toward electric vehicles and renewable energy, presenting economic opportunities and contributing to sustainable development.

- ***The Hydrogen Switch: Go clean in the transport sector***

There are a variety of other options from investing in or promoting hybrid vehicles, hydrogen, fuel cells and a range of electric mobility systems. Namibia needs to assess all the options and then clearly define the sustainable mobility pathway. Major industrialists such as Swedish-Swiss ABB are developing commercial approaches supported by the International Maritime Organization to use hydrogen.[23] With Namibia looking at becoming a hydrogen hub, this is an opportunity not to be missed as a refuelling point. Here the suggested replacement of fossil fuels with locally produced green hydrogen could add as much as 2 per cent to Namibian GDP. However, plans will need to factor in how the green hydrogen will be transported to Walvis Bay from Lüderitz, which is expected to be the hub of production.

- ***Climate Adaptation and Just Transition***

Namibia's NDC places emphasis on adaptation and developing future climate resilience to reduce climate threats to its populations and their livelihoods. It is important that it expands its ongoing projects, such as the community-based adaptation programmes, which are focusing on the livelihoods of agricultural and pastoral communities in the north-central and far northeast regions of Namibia. These projects, coupled with community-based projects to build resilience to climate change by increasing resilience against climate-induced land degradation, will increase the scope of a just transition that offers social and environmental protection against climate loss and damage. The NDC's adaptation work is also focused on food security and sustainable biological resources; sustainable water resources base; human health and wellbeing; and infrastructure development. These are all critical aspects of achieving social and environmental justice.

- ***Secure substantial funding to enhance renewable energy sector***

Namibia clearly has several energy alternatives that it can choose to pursue a cleaner energy pathway. A few of those alternatives are already in place as well as other options that have been mooted by national agencies, such as NamPower, and set out in the NDC. It will be necessary to secure substantial investment capital to implement a sustainable and just energy transition. It is recommended that Namibia must continue to strengthen its NDC Partnership's integrated planning process to strengthen coordination, resource mobilisation, and transparency on NDC implementation.

- ***The Nuclear Energy Paradox, the Outlier Syndrome***

Whilst nuclear energy is a source of carbon-free electricity that can be useful for Namibia's energy security, there remains much controversy around the risks associated with historical nuclear

accidents and the treatment of nuclear waste. This risk may be less due to advances in technology such as the small nuclear reactors and safety safeguards about nuclear waste disposals. Namibia will have to stay engaged and be decisive on the possibility of adding nuclear energy to its energy mix.

Conclusion

Namibia's strategic positioning on the global stage, particularly in the green transition, is clear. The fusion of its critical mineral wealth and the potential of green hydrogen is important for its own energy transition, but also to contribute to global solutions in meeting net zero targets per the Paris Agreement. Renewable resources will help to reduce Namibia's reliance on expensive imported fuel and energy – as well create local green jobs. There are positive indications that Namibia has the potential to serve as a sustainable energy capital on the African continent.

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