MISSION 300
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NATIONAL ENERGY COMPACT
FOR NAMIBIA

Preamble

The Government of the Republic of Namibia (GRN) is committed to ensuring that all citizens have access to reliable, affordable, sustainable, inclusive, and clean energy. This National Energy Compact (hereafter referred to as the 'Compact') serves as a strategic framework to accelerate progress towards achieving universal energy access by 2040, reflecting Namibia's dedication to sustainable development and energy equity.

As of 2023, Namibia has made commendable strides, increasing overall electricity access to 59.5 percent. However, significant challenges remain in achieving universal access. Due to cost-reflective tariffs, Namibia has one of the highest electricity tariffs in Africa, making affordability a crucial barrier to overcome for scaling up electrification efforts. The GRN is determined to reach a 70 percent electrification rate and improve clean cooking access to 61 percent by 2030. With over 50 percent of households still dependent on traditional fuels and technologies for cooking, there is a pressing need for advancements in access to clean cooking and electrification solutions. This Compact outlines actionable commitments to address these challenges and achieve transformative energy outcomes.

Namibia is endowed with exceptional renewable energy potential, particularly in solar and wind resources, which are among the highest globally. The country is committed to enhancing the share of renewable energy in its generation mix from the current 54 percent to 70 percent by 2030. Achieving this goal will require the addition of 454 MW of new installed generation capacity from solar, wind, hydro, and biomass. The GRN is focused on mobilizing significant public and private sector financing by continuing to create a favorable investment climate, strengthening local stakeholder interactions and capacities through training, and establishing robust data collection systems for informed energy planning and decision-making.

Aligned with the national long-term plan, Vision 2030 and the emanating national development plans, Namibia envisions a transformative green industrialization program. By leveraging its abundant, renewable resources, raw materials, innovative technological solutions and clean manufacturing processes, Namibia aims to become a key player in green shoring and a major producer of clean green hydrogen and other complex compounds essential for decarbonizing hard-to-abate sectors. This initiative aims to boost its economic growth, generate substantial employment opportunities, attract foreign investments, and position Namibia as a competitive player in the global green economy.

The Compact emphasizes regional integration and the vital role of private sector participation in achieving these objectives. Namibia aims to leverage its outstanding renewable energy resources to enhance energy security, fostering cross-border collaborations while encouraging private investment, including in relation to the recent offshore oil and gas discoveries in the Orange Basin.

This Compact was developed through extensive engagements and consultations with various stakeholders, including development partners, private sector, and civil society, to foster partnerships crucial for achieving the Compact's ambitious goals. Recognizing that success requires capacity building and considerable collective efforts, the GRN calls upon development partners, philanthropies, the private sector, and civil society to join this transformative journey. Together, the Namibian government aims to accelerate the pace of energy access and renewable energy development. Meeting the targets of this Compact is estimated to cost US$1.76 billion, with US$411 million expected to be mobilized from the private sector. The remaining funding needed at this stage is estimated at US$1.05 billion out of which US$255 million is already expected from the private sector through commitments. Additionally, from the Compact, funding will also be needed for the Baynes Hydropower project presented separately given its size estimated at this stage at US$ 1.6 billion (potentially through public financing mechanisms).

The Namibian government aims to position the energy sector as a catalyst for the socio-economic development of the country and the SADC region, creating jobs, skilling youth, empowering women and supporting local communities in the vicinity of the planned projects. This will be greatly enhanced through Namibia acting both as a source of clean abundant energy and as a “conduit” to facilitate north/south energy flows through planned inter-connecting transmission lines. This strategy will enable Namibia to be a major contributor to improve regional energy security, diversify sources, reduce import dependency, stimulate economic growth, attract investments, and create job opportunities, ensuring inclusive benefits for local communities.

Abbreviations

AC	Alternating Current
ANNA	Angola-Namibia Interconnector
BESS	Battery Energy Storage System
BONA	Botswana-Namibia interconnector
CBM	Condition-Based Maintenance
CC	Clean Cooking
CENORED	Central Northern Regional Electricity Distributor
COD	Commercial Operation Date
CoW	City of Windhoek
DRE	Distributed Renewable Energy
ECB	Electricity Control Board
Erongo RED	Erongo Regional Electricity Distributor
GDP	Gross Domestic Production
GLCEP	Geospatial Least Cost Electrification Plan
GRN	Government of the Republic of Namibia
HE	Higher Education
HVDC	High Voltage Direct Current
IFRS	International Financial Reporting Standard
IPPs	Independent Power Producers
kWh	Kilowatt-hour
LPG	Liquefied Petroleum Gas
LV	Low Voltage
M&E	Monitoring and Evaluation
MIME	Ministry of Industries, Mines and Energy
MOU	Memorandum of Understanding
MSB	Modified Single Buyer
MV	Medium Voltage
MW	Megawatt
NDP	National Development Plan
NELFP	National Electrification Fund Portfolio
NES	National Electrification Strategy
NIRP	National Integrated Resource Plan
Nored	Northern Regional Electricity Distributor
NP	NamPower
NREP	National Renewable Energy Policy
NSA	Namibia Statistics Agency
NTA	National Training Authority
NUST	Namibia University of Science and Technology
OMS	Outage Management Systems
OPE	Oshakati Premier Electric
PAYGo	Pay-As-You-Go
PBR	Performance-Based Regulation
PPAs	Power Purchase Agreements

PPP	Public Private Partnership
PUE	Productive User of Energy
PV	Solar Photovoltaic
QOSSS	Quality of Service and Supply Standards
RBF	Results Based Financing
RE	Renewable Energy
REDs	Regional Electricity Distributors
SADC	Southern African Development Community
SAPP	Southern African Power Pool
SCADA	Supervisory Control and Data Acquisition
SHS	Solar Home Systems
STEM	Science Technology Engineering and Mathematics
TCAs	Transmission Connection Agreements
ToT	Training of Trainers
TVET	Technical and Vocational Education and Training
UNAM	University of Namibia
US$	United States Dollar
VAT	Value Added Tax
VRE	Variable Renewables
VTC	Vocational Training Center
ZIZABONA	Zimbabwe, Zambia, Botswana, Namibia interconnector

Contents

1

Declaration of Commitment

The Government of the Republic of Namibia (GRN) is committed to ensuring reliable, affordable, sustainable, inclusive, and clean energy for all its citizens and as a contributor to regional development. To this end, the GRN intends to undertake the following:

- Accelerating the pace towards universal access to electricity: Targeting an increase in national energy access rate from 59.5 percent to 70 percent by 2030, with a focus on peri-urban areas through grid electrification and rural electrification through a range of off-grid solutions, expanding electricity access to an additional 210,000 households.
- Advancing access to clean cooking solutions: Enhancing clean cooking access from the current 48.5 percent to 61 percent by 2030, significantly improving the quality of life for women and marginalized communities by promoting alternative fuels and clean cooking technologies, benefiting the additional households. This would require providing clean cooking technologies to 200,000 new households by 2030.
- Enhancing energy security by scaling up renewable energy: Expanding the share of renewable energy in the local generation mix from the current 54 percent to 70 percent by 2030, through investments in solar, wind, biomass, and hydropower, while simultaneously strengthening and modernizing the transmission and distribution infrastructure. Namibia will also focus on regional integration by building interconnectors with neighboring grids, positioning itself as an energy hub in Southern Africa and contributing to the regional energy transition.
- Facilitating private sector participation: Creating an enabling environment for private sector participation in the energy sector with the goal of mobilizing a total of US$411 million in private investments to support Namibia's energy transition and development goals by 2030.
- Mobilizing Civil Society: Explore avenues for civil society cooperation to accelerate awareness raising amongst citizens to foster faster adoption of alternative fuels and clean cooking technologies. Civic education can strengthen understanding of the benefits especially economic advances for consumers.

To achieve the targets outlined in the Compact, the GRN commits to addressing critical bottlenecks across the energy value chain as outlined in the Compact's Action Plan. In particular, the GRN commits to:

PILLAR I
CAPACITY EXPANSION AND COST REDUCTION

- Fast track generation and mobilize private sector: The GRN plans to add 454MW of additional installed capacity by 2030, inclusive of 234 MW from Independent Power Producer (IPP) projects, and pending decisions on financial structure, final design and wind studies, a total of 740MW of additional capacity by 2030, comprising 440MW hydro and 300MW from other renewables (e.g. wind).
- Diagnostic/assessment to identify bottlenecks to deployment of generation: Conducting a diagnostic assessment to identify bottlenecks in competitive procurement with a view to fast-track generation of renewable energy projects.
- Integrated planning: Update and approve a comprehensive least cost National Integrated Resource Plan (Master Plan) by 2026, incorporating generation, transmission (including grid resiliency strategy), battery storage, and climate resilience. This will be supported by a collaborative process led by the MIME with technical inputs from the national utility to be developed. An iterative update will be required every two to three years.
- Strengthen coordination: Enhance the coordination with representatives of the industry, from the Electricity Control Board (ECB), MIME, NamPower and REDs to ensure more effective collaboration and smoother implementation.

PILLAR II
REGIONAL INTEGRATION AND POWER TRADE

- Adopt SAPP transmission pricing: Adopt and enforce the new Southern African Power Pool (SAPP) transmission pricing methodology by 2027 to facilitate enhanced power trade (leveraging the cost reflective approach promoted).
- Develop an Action Plan in coordination with neighboring countries around the prioritized Regional Trade Scenario(s).
- Finalize the Angola-Namibia (ANNA) Interconnector: Finalize the business model and secure necessary financing to achieve the commercial operation date (COD) for Namibia component by 2029.
- Complete the Zimbabwe, Zambia, Botswana, Namibia (ZIZABONA) Interconnector: Targeting the commercial operation date (COD) for Namibia component by 2027, ensuring timely completion and integration into the regional grid.

- Conduct capacity building in transmission planning (domestic and cross-border) to facilitate power trade as required.

PILLAR III
LAST MILE ACCESS

- Accelerate electrification to reach national targets through coordinated grid and off-grid expansion: The GRN will pursue an accelerated electrification drive to achieve 210,000 new household connections by 2030, including 175,000 through the grid and remaining 35,000 via off-grid solutions, representing a fourfold increase in the current annual connection rate and supporting the national objective of 70 percent electricity access.
- Operationalize main access strategies: Update, approve and implement the National Electrification Strategy, updated by Distributors Master Plans, by 2026 to ensure comprehensive and efficient electrification across the nation.
- Implement the national electrification fund: Build and implement the National Electrification Funding Portfolio (NELFP) to optimize and diversify funding sources and establish a financing mechanism to support access initiatives under the NELFP by 2026. This includes mobilizing the necessary budget and grants to ensure tariff affordability and access targets by 2030.
- Establish a dedicated unit for energy access programs: Create a unit to manage the energy access program, inclusive of clean cooking initiatives, to streamline efforts and enhance program effectiveness.
- Launch a phased approach for off-grid solar and clean cooking solutions: Initiate an off-grid solar and clean cooking pilot program by 2026 with plans for nationwide expansion thereafter. Develop a roadmap and action plan to guide this phased approach, with a focus on women, ensuring strategic and effective implementation.
- Strengthen capacity and stakeholder engagement: Enhance the capacity to plan, manage, and implement the access program, ensuring that all stakeholders are equipped to drive successful energy access initiatives.
- Implement national standards and testing facilities: Establish national standards for off-grid solar and clean cooking systems, including electric, LPG, and improved biomass stoves. Upgrade certified testing facilities to ensure compliance with international standards.
- Develop "smart" (timebound and pro-poor) tax exemptions and incentives: Evaluate and establish tax exemptions or reductions on import duties and VAT for certified off-grid energy solutions to improve affordability and market growth as needed. Evaluate and create tax incentives for financial instruments to attract private sector investment to the extent needed.
- Promote local employment and enterprise development through electrification: Facilitate the creation of a community-based off-grid energy services industry by enabling private sector involvement through small enterprises to deliver, maintain, and service off-grid systems. Focus will be placed on recruiting and training local residents, including youth, to carry out basic system maintenance, cleaning, and diagnostics, supporting job creation in newly electrified areas. Promote the Productive Use of Electricity (PUE) to maximize the benefits of having access to electricity and improve their livelihoods.
- Advance gender equality in energy access delivery: Embed gender-responsive design into off-grid programs by ensuring that women are equitably included in training, maintenance roles, and enterprise development. This includes supporting women-led microbusinesses in the energy value chain and prioritizing gender inclusion in recruitment, capacity building, and community engagement.

PILLAR IV
PRIVATE SECTOR PARTICIPATION

- Enhance the IPP and MSB deployment scheme: Conduct an assessment to identify the challenges and bottlenecks limiting and/or constraining the uptake of electricity under the MSB scheme, hindering IPP projects, and potential mitigation measures. Develop a plan identifying Battery Energy Storage Systems (BESS) requirements for the grid (in line with Least Cost Masterplan); respective deployment scheme and business model; and how private/public sector can be leveraged to implement such investments.
- Establish carbon credit framework: Establish clear eligibility requirements, transparent processes, and support the enabling environment for unlocking access to carbon finance opportunities, including for the clean cooking sector.
- Strengthen coordination among key stakeholders: Define a process for enhanced coordination between MIME, NamPower and ECB to ensure efficient issuing of licenses, permits, and facilitation of energy projects.

PILLAR V
FINANCIALLY VIABLE AND OPERATIONALLY COMPETENT UTILITIES

- Adopt performance-based regulation: Adopt and implement a Multi-year Performance-Based Regulation (PBR) regime by 2026/2027 to improve efficiency within the energy sector, ensuring that regulatory practices drive optimal performance and service delivery.

- Conduct a diagnostic of the financial sustainability of the distributors: Assess the financial sustainability of the distributors and formulate recommendations to inform a sustainable electrification business model.
- Develop a comprehensive financing strategy: Formulate a sustainable financing strategy by 2026 for public infrastructure investments to minimize tariff impacts, particularly for targeted expansions in infrastructure, ensuring sustainable financial planning and investment.
- Enhance regulatory oversight: Implement the E-QOSSS Outage Management System by 2027 to enhance quality of service standards, improving reliability and customer satisfaction within the energy sector.
- Enable digitalization and smart grid development: Support distributors in expanding grid intelligence through investments in digital infrastructure, including SCADA systems, smart metering, and automated outage management tools. These upgrades will improve grid reliability, operational efficiency, and planning precision across both urban and rural networks.

The GRN understands the need for transparent monitoring of the Compact through a structured monitoring and evaluation (M&E) framework supported by MIME and other stakeholders. Data collection and feedback mechanisms will guide policy adjustments and track progress in achieving universal energy access. Monitoring efforts will be integrated into a new and dedicated Project Implementation Unit (PIU) at MIME, adequately staffed.

The PIU will oversee the implementation of the Compact and ensure progress towards achieving its targets while tracking the progress of the energy implementation plan of MIME between 2025 and 2030. As part of the Compact, the GRN aims to reduce gender gaps in the energy sector. Additionally, it seeks to maximize the socio-economic benefits of access to electricity and clean cooking solutions by creating more job opportunities both within and outside of the energy sector, ultimately enhancing the livelihood of Namibians.

Call for Partnerships

The GRN invites development partners, philanthropies, civil society and private sector stakeholders to support Namibia's journey toward universal access to affordable, reliable, sustainable, inclusive, and clean energy. These efforts will foster economic growth, create income opportunities, jobs and contribute to the country's development goals.

Funding needs from the public and private sectors by 2030 [US$ Million]

	Generation[1]	Transmission (66kV and above)	Distribution (33kV and below)	Rehab (distribution)	Last-mile connections on-grid	Off-grid	Clean cooking	Technical Assistance	Total[2]
Public	361	447	60	76	357	14	18	20	1,353
Private	390	0			0	21	0	0	411
Total	751	447	60	76	357	35	18	20	1,764

[1] Excludes Baynes Hydro Project, which requires US$ 1.6 billion financing
[2] Secured funding of US$ 718 million included in the total (US$ 1,05 billion still to be secured, out of which US$ 255 million from the private sector)

1.1

Compact Targets and Action Plan

This Compact presents high-level commitment actions, with specific targets and timelines to drive progress towards the achievement of universal access to energy in a reliable, affordable, and sustainable manner.

Indicator	Current rate and pace	Target by 2030
Increase Electricity Access Rate	59.5% electrification rate in 2023[3], 46.9% grid, 12.6% off-grid solar Current Annual Pace Between 2017 and 2021: -0.2% p.a. (2017-2021) 0.7% p.a. (2017-2023)	70% electrification rate by 2030 Targeted pace between 2025 and 2030: 2.7% p.a.
Increase Access to Clean Cooking	0.9% p.a. (2017-2021) (Access to clean cooking was 48.5% in 2023[4])	3.6% p.a. (to achieve 61% access by 2030)

Indicator	Current Share Renewable Energy in Fuel Mix	Target by 2030
Increase share of Renewable Energy[5]	54% (energy basis) (498.5 MW of RE out of 695 MW total installed capacity in December 2024)	70%[6] (energy basis) (454 MW of additional RE installed capacity) Targeted breakdown of installed capacity by 2030: 952.5MW RE out of 1,149 MW as follows 466.5 MW[7] Solar (120MW reserved for IPPs) 99 MW Wind (all IPP) 347 MW Hydro 40 MW Biomass In addition 96 MWh BESS (51 MWh 1h, 45 MWh 2h)

[3] Namibia 2023 Population and Housing Census
[4] Ibid
[5] Data for NamPower and IPPs having a PPA with NamPower
[6] National RE Policy launched in 2017 "aims for 70% or more of electricity generated in the country to be from Renewable Energy sources by 2030"
[7] The 2024 Ministerial Determination approved 330MW of new capacity from solar PV - including 120MW for IPPs.

	Baseline	Target by 2030
Amount of Private Capital Mobilized	US$ 156 million	US$411 million

Action Plan

Achieving the above overarching trajectory targets will require critical reform actions to be taken across the energy sector value chain, the most critical of which are included in the action plan below.

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
I: Capacity Expansion and Cost Reduction	Integrated Least Cost Power System Planning adopted incorporating regional resources	Yes	• Fast Tracking Generation and Mobilizing the Private Sector: Increase Installed Capacity[8] to 1,149 MW by 2030 to increase generation capacity and reduce high-cost imports by leveraging more competitive national PV and wind generation to minimize exposure to foreign exchange risks associated with imports – Install 454MW additional Capacity by 2030, out of which 234MW will be IPP projects – Launch the procurement of 740MW additional capacity, pending decisions on financial structure, final design and wind studies, by 2030 (440MW hydro, 300MW other renewables[9]) – With the objective to reach approximately 80% of Renewable Energy installed capacity by 2030 • Update and approve a comprehensive least cost National Integrated Resource (Master) Plan by 2026 – Incorporate generation, transmission, and climate resilience factors in addition to generation, in coordination with electrification targets; – Support this process by a collaborative effort led by MIME, with technical inputs from the national utility. – Conduct an economic analysis for the use of natural resources for grid stabilization, such as natural gas, as baseload alternative to balance variable renewable energy supply. • Strengthen the coordination with representatives from ECB, MIME, NamPower and distributors: – Define and implement arrangements to systematically update the NIRP every three years under the leadership of

[8] Refers to contracted capacity with the utility.

[9] 150 MW wind IPP is expected to be commissioned by 2030

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
			the MIME Planning Department, with strong technical support from NamPower and ECB – Enhance electricity sector planning capacities within MIME to lead systematic planning and monitor the timely implementation of planned projects. • Establish the PIU: The PIU will oversee the implementation of the Compact and ensure progress towards achieving its targets while tracking the progress of the energy implementation plan of MIME between 2025 and 2030.
	Develop energy efficiency program		• Develop and implement an energy efficiency program with clear objectives relating to energy consumption in coordination with local stakeholders, as applicable.
	Competitive procurement policy and framework in place for private sector investment in power projects		• Conduct a diagnostic to identify bottlenecks in: competitive procurement processes for accelerating generation and define/implement mitigation measures.
II: Regional Integration and Power Trade	Enhance Readiness for Regional Interconnection & Power Trade	No	• Enhance policy and enabling environment – Adopt and enforce the new SAPP transmission pricing methodology to facilitate power trade by 2027 (leveraging the cost reflective approach promoted) – Complete BESS strategy to support grid stability and regional trade by 2026. – Develop an Action Plan in coordination with neighboring countries around the prioritized Regional Trade Scenario(s) by 2026. – Standardize export license requirements to align with strategic goals and technical pre-requisites. – Finalize the business model and secure financing for the Namibian section of the Angola-Namibia (ANNA) Interconnector (400kV) targeting COD for Namibia component by 2029, in line with the country's integrated generation and transmission plan. • Complete the feasibility study for the Zimbabwe, Zambia, Botswana, Namibia (ZIZABONA) Interconnector targeting COD for Namibia component by 2029.

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
			• Complete an economic and financial pre-feasibility study for new cross-border transmission capacity for the Botswana-Namibia (BONA) Interconnector by 2027. – Conduct capacity building in transmission planning (domestic and cross-border) to facilitate power trade as required.
III: Last Mile Access	Monitoring & evaluation program adopted to track the multi-tier framework for access to electricity and clean cooking	Yes	• MIME to collaborate closely with the Namibia Statistics Agency (NSA) to regularly monitor and track progress on energy access, including electricity and clean cooking, using the 2023 census and affordability study as a baseline (a household survey was conducted to measure energy access using the multi-tier framework approach). • Establish annual data collection and review cycles, enabling adaptive program design and timely policy interventions. • Develop digital data platforms to publicly share results and drive evidence-based accountability.
	National Electrification Strategy adopted including an updated 5-year electrification plan with a clearly defined role for private sector	No	• Develop a Sustainable Electrification Business Model to support electrification efforts, aligned with households affordability. – Advance both grid and off-grid initiatives in rural and peri-urban areas, taking into account household affordability, such as connections and internal wiring. Promote clean cooking solutions. • Update, approve and implement the National Electrification Strategy (NES), updated by Distributors Master Plans by 2026.
	Establish the dedicated project unit (as part of the PIU)		• Establish a dedicated project unit by 2026 – Provide overall leadership and define annual electrification targets, including clean cooking. – Develop and implement a comprehensive Monitoring and Evaluation (M&E) framework. – Coordinate grid and off-grid investments. – Lead stakeholder coordination, including REDs and off-grid providers.

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
			– Use a geospatial platform to manage, visualize, and support communication of annual targets. • Customize M&E to enable public-facing reporting and adaptive planning.
	Operationalize National Electrification Funding Portfolio (NELFP)		• Establish a diversified funding portfolio from levies, budget allocations, DFIs, and other partners. • Define and implement co-financing and incentives for low-income households. • Develop a Productive Use Program with financing and business development support for rural entrepreneurs.
	Enhance investment in DRE applications (SHS and clean cooking)	No	• Appoint in-house technical support within MIME to drive clean cooking and off-grid energy deployment: – Identify and address social, cultural, institutional and technical gaps through focused technical studies and stakeholder engagement. – Launch a joint off-grid and clean cooking pilot program in 2026, preparing for scale-up with lessons learned from implementation. – Implement targeted consumer awareness and behavior change campaigns to support the government in rolling out DRE solutions, increasing adoption rates, and addressing concerns over reliability and affordability. – Build partnerships with local manufacturers and distributors to strengthen the supply chain and encourage local assembly of clean cooking and SHS products. – Implement a results-based financing (RBF) pilot to catalyze market-based delivery of SHS and clean cooking solutions by 2026. – Engage local financial institutions to expand consumer financing options, including pay-as-you-go and microcredit models.

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
	National clean cooking strategy in place		• Target the rollout of clean cooking solutions to 200,000 households by 2030 through a phased national implementation plan. • Develop a national clean cooking strategy that is holistic, gender-sensitive, and aligned with energy, health, and climate goals. • Ensure the strategy builds on pilot outcomes, includes market activation pathways, and integrates financing mechanisms, local capacity development, and innovation support. • Link the strategy with Nationally Determined Contributions (NDCs) to unlock climate finance.
	Technical, policy and regulatory framework		• Evaluate and establish tax exemptions or reductions on import duties and VAT for certified off-grid energy and clean cooking solutions to improve affordability and market growth as needed. Evaluate and create tax incentives for financial instruments to attract private sector investment to the extent needed. • Strengthen the existing capacity of certified testing/verification facilities to deliver reliable testing results in line with international standards for off-grid solar solutions. • Develop and enforce national standards for clean cooking technologies, supported by the establishment and capacity enhancement of local testing and certification centers. • Streamline approval and registration processes for clean cooking products to reduce delays and cost barriers. • Incorporate clean cooking and DRE into the energy regulatory framework, ensuring long-term market development support.
	Promote local employment and enterprise development through electrification		• Facilitate the creation of a community-based off-grid energy services industry by enabling small enterprises to deliver, maintain, and service off-grid systems. Focus will be placed on recruiting and training local residents, including youth, to carry out basic system maintenance, cleaning, and diagnostics, supporting job creation in newly electrified areas. • Plan to increase job creation through an electrification program, considering the following actions to be assessed

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
			and prioritized *[see annex 7 for detailed approach on maximizing the socio-economic benefits associated to the implementation of the Compact]:* – Invest in increased vocational training and consolidate certification programs to develop a pool of skilled technicians, engineers, and project managers who can support both grid and off-grid electrification projects. – Foster collaborations between the government and private sector PPPs to create job opportunities in the renewable energy sector, including roles in installation, maintenance, and sales. – Promote entrepreneurship and innovation in the energy sector by providing funding, mentorship, and incubation support to startups working on innovative energy solutions. – Implement programs to encourage the participation of women in the energy sector, providing training and opportunities for them to take on various roles within the industry. – Develop targeted employment schemes for rural areas, focusing on the installation and maintenance of off-grid solar systems and the provision of clean cooking solutions. – Facilitate access to microfinance and low-interest loans for small businesses and entrepreneurs in the renewable energy sector, enabling them to expand their operations and create more jobs. • Prioritize PUE to enhance affordability and sustainability in interventions such as grid-supported or off-grid solar water pumping and agricultural product processing, pending pre-feasibility assessment and stakeholder consultation.
	Advance gender equality in the energy sector, in particular in in energy access delivery		• Develop and operationalize the national women's inclusion gender and energy strategy • Embed gender-responsive design into off-grid programs by ensuring that women are equitably included in training, maintenance roles, and enterprise development. This includes supporting women-led microbusinesses in the

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
			energy value chain and prioritizing gender inclusion in recruitment, capacity building, and community engagement.
IV: Private Sector Participation	Financial support to private sector distributed renewable energy and clean cooking operators ensures affordability and viability	Yes	• Facilitate access to working capital loans, innovation grants, and other financial instruments to scale up business operations and strengthen capacity building for local private sector players. • Establish clear eligibility requirements, transparent processes, and a supporting enabling environment for unlocking access to carbon finance opportunities, including for the clean cooking sector.
	Strengthen legal, regulatory and tendering frameworks for attracting and supporting private investment across the energy sector value chain		• Evaluate how current IPP procurement contractual framework for NamPower and REDs tender requirements can be improved to attract more PSP and faster (e.g., review the role of the State in IPP transactions and clarify the export regime) by 2025.
	Increase private sector participation in generation, transmission and/or grid stabilization		• Procure IPP projects with a total value of US$ 390 million by 2030 on RE generation (excluding Baynes Hydro). • Support the wider use of embedded VRE resources through i) Support of MSB Contestable Customers procuring energy from Independent Power Producers (IPPs) ii) Support the increased use of VRE through solar PV rooftop systems, BESS and “behind-the-meter” batteries • Engage key Namibian public stakeholders through consultations on how best to integrate the role of private sector capital for mobilization across the value chain and propose mitigating or corrective actions. • Accelerate the growth of IPPs installed capacity to increase their contribution from 19% in 2024 to over 40% in 2030 (515.5 MW IPPs out of 1,300 MW total installed capacity by 2030) • Investigate the challenges that hinder the adoption of the MSB model to expedite private sector participation in electricity generation.

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
			• Investigate the use cases of Independent Transmission Operation (IPT), developing dedicated transmission infrastructure specifically designated to serve IPPs generators and commercial clients, such as mines.
	Conduct a review of constraints to private sector capital mobilization across the value chain and propose mitigating / corrective actions.		• Assess challenges and bottlenecks, constraining and/or limiting electricity uptake under the MSB scheme, impeding IPP projects, and identify potential mitigation measures. • Strengthen coordination among key stakeholders: Define a process to enhance coordination between MIME, NamPower and ECB to ensure efficient issuing of licenses, permits, and facilitation of energy projects.
	Enable private sector participation in the development/finance/construction/operation of utility scale BESS systems to support the national grid and enable regional trade.		• Determine regulatory readiness for the private sector in BESS including licensing arrangements (2025) • Develop a BESS deployment scheme to identify the business model for private versus public BESS by 2025.
V: Financially Viable and Operationally Competent Utilities	Audited annual financial statements of utilities published	Yes	• Ensure timely submission of financial statements by all REDs in line with the International Financial Reporting Standard (IFRS).
	Utilities achieving at least 100 percent operational cost recovery	No	• Adopt and implement a performance based regulatory (PBR) regime, with multi-year price control periods by 2026/2027 to improve efficiency. • Provide embedded support for distribution utilities by 2026 to support and train utilities in planning and financial modeling. • Develop a financing strategy by 2026 for public infrastructure investments to minimize tariff impacts, for targeted expansions in infrastructures, particularly: – The GRN to define a strategy to optimize financing arrangements for investments in new lines and system reinforcement, rehabilitation, and upgrade of existing infrastructure (transmission and distribution networks) to minimize impact on the average end-user tariff level

Pillar	Action category	Baseline Data (2024)	Target Year & detailing the action needed to achieve goal (including timeline)
	Utility-specific plan to improve service quality approved by regulator	No	• Implement the E-QOSSS Outage Management System by 2027 to improve quality of service standards and regulatory oversight: – The ECB to define and implement procedures for regulatory oversight of the operational and financial performance of NamPower and distributors, focusing on compliance with applicable quality of supply and service standards (QoSSS) in service delivered to customers. – Incorporate a comprehensive Outage Management System (OMS) (specifically including MV and LV lines and customers) to receive, record and optimize the management and resolution of complaints received from customers regarding outages and other incidents in electricity supply, allowing for the restoration of normal service in the shortest possible period. • Enable digitalization and smart grid development: Support distributors in expanding grid intelligence through investments in digital infrastructure, including SCADA systems, smart metering, and automated outage management tools. These upgrades will improve grid reliability, operational efficiency, and planning precision across both urban and rural networks.

2

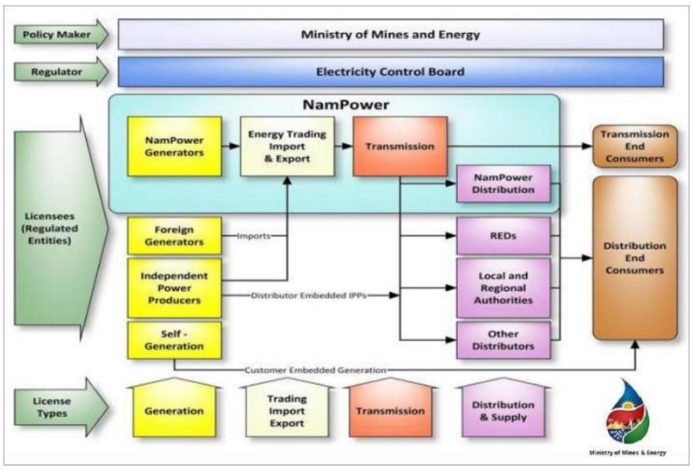
Country and Sector Overview

Namibia is an upper middle-income country located on the west coast of Southern Africa. The country is mostly semi-desert and has a population of approximately 3 million people and a land area of about 825,000 square kilometers, resulting in a countrywide density of 3.6 persons per square kilometer, among the lowest in the world. The largest city is Windhoek, the capital, with a population of about 490,000. Its western border is the Atlantic Ocean. It shares land borders with Angola and Zambia to the north, Botswana to the east and South Africa to the south. Namibia has the least rainfall of any country in sub-Saharan Africa. Despite significant GDP growth since gaining independence from South Africa in 1990, poverty and inequality remain significant in the country. Unemployment among 15-64-year-olds remains high, particularly among women and the youth. [10] About 40% of the population lives in poverty and income disparity remains one of the world's highest with a Gini coefficient of 59.1 [11].

Most of Namibia's people live in rural areas and have a subsistence way of life. Although arable land accounts for less than 1 percent of Namibia, nearly half of the population is employed in agriculture. Namibia's economy is closely tied to South Africa's due to their shared history. The largest economic sectors are mining (18% of GDP), public administration (12.9%), manufacturing (10.1%) and education (9.2%). Namibia has a highly developed banking and financial sector with modern infrastructure.

The MIME is responsible for policymaking and planning of the power sector of the country. The Electricity Control Board (ECB) is the agency in charge of technical and economic regulation of the sector, licensing operating companies and overseeing and monitoring their performance. Namibia Power Corporation Pty. Ltd. (NamPower), a company owned by the GRN and operating as the national utility, is responsible for electricity generation, and transmission (high (HV) voltages from 66 to 400 kV), and some medium (MV) voltage distribution (11 to 33 kV), and supply to around 3,000 end-users connected to transmission and HV and MV distribution networks nationwide. The generation segment also comprises 27 IPPs, with all but one operating solar PV plants.

An institutional reform gradually implemented over the last two decades established a distribution and retail segment formed by five regional electricity distributors (REDs) providing electricity service to end-users connected to MV and low-voltage (LV) distribution networks. At present three of the REDs are operational, while the other two (one of which will absorb the City of Windhoek utility serving the nation's capital) are still being established. Until 2019, NamPower functioned as Single Buyer, being the power purchaser to IPPs and the exclusive electricity supplier to end-users connected to transmission networks (HV) and some MV distribution networks as well as to all the electricity distributors. From September 2019 the Modified Single Buyer (MSB) model was incorporated, allowing certain categories of consumers (Contestable Customers) to purchase up to 30 percent of their electricity needs directly from IPPs (Eligible Sellers). As of June 2024, there were 30 Contestable Customers in the sector using that partial freedom to choose suppliers. To date, only a few Contestable Customers have made use of that option.



Approximately half of Namibia's population does not have access to electricity. The electricity access rate is 59.5 percent, mostly grid-connected, leaving roughly 212,519 rural households, and 94,005 urban households without access to electricity according to the 2023 Census. As Namibia's population is growing at a high rate (~3% per annum from 2011 to 2023), achieving universal access to electricity service will require the acceleration of the electrification pace. The average energy access rate between 2017 and 2023 was around 0.7% per annum. Due to cost-reflective tariffs, Namibia has one of the highest electricity tariffs in Africa, making affordability crucial for scaling up electrification efforts.

Namibia's existing electricity generation remains constrained. In 2024, Namibia's installed power capacity was 695MW, [12] while peak demand stood at 632 MW in

[10] This is the latest data available for Namibia extracted from the World Bank's Poverty & Equity Brief on Namibia dated April 2024.
[11] The Gini index has steadily declined from 63.3 in 2003 to 59.1 in 2015. This is the latest data available for Namibia extracted from the World Bank's Poverty & Equity Brief on Namibia dated April 2024.
[12] Electricity Control Board Annual Report, 2023. Not taking into account rooftop solar PV of approximately 80 MW. Available at https://www.ecb.org.na/wp-content/uploads/2023/11/ECB-Annual-Report-2023-web.pdf.

2023 [13] and is expected to increase to 1,243 MW by 2040. [14] Over 60 percent of Namibia's local electricity generation is from hydropower resources which have been impacted in recent years by severe droughts, likely due to the increased climatic changes experienced worldwide. [15] Namibia Power Corporation Limited (NamPower), the national utility, owns and operates a 347 MW run-of-the-river hydropower station (Ruacana). [16] Thermal power accounts for an additional 30 percent (coal and heavy fuel oil). In addition, the country has 131.5 MW (solar PV and wind (5 MW)) through IPPs, as well as customer-owned solar PV capacity. NamPower also owns and operates its own 20MW solar PV plant.

The GRN has taken an important policy decision to increase domestic supply and reduce electricity import dependency through the procurement of public and private investments in electricity generation. In 2023, NamPower imported on average 58 percent of its energy requirements. [17] Although imports from South Africa have so far remained reliable, there is a potential risk of disruption in the future if sector conditions deteriorate in South Africa, or if the bilateral contracts are not renewed. During peak hours and low generation at the Ruacana hydropower plant – when coal fired electricity is highest – Namibian imports can rise to 90 percent. This creates import dependence and impacts Namibia's fiscal position. High imports have also led to high foreign exchange demand and high electricity costs, which place a burden on the balance of payments and budget, and vulnerable electricity supply. In this context, energy security has emerged as a key priority for the GRN, in addition to electricity access.

The GRN and NamPower have committed to enhancing energy security, reducing the current dependence on electricity imports, by building more domestic generation capacity. The fifth National Development Plan (NDP5) for 2017/18 – 2021/22 outlines the importance of secure and reliable electricity provision to improve the country's competitiveness. NDP5 further sets a target of 70 percent of electricity needs to be met from renewable resources by 2030. The GRN also announced an 80 percent target for locally generated primary energy by 2028, which represents a twofold increase from what it generates locally today. [18] The National Renewable Energy Policy (NREP) adopted in 2017 aims to drive emerging technologies that substitute existing higher emission technologies with cleaner, more efficient technologies and signals the GRN's commitment to a clean energy future powered by renewables. The NREP policy sets out objectives to: (i) make renewable energy a vehicle for expanded access to affordable electricity in Namibia; (ii) create an enabling environment for renewable energy development; and (iii) enhance value chains to enable greater participation of Namibians in the sector. Similarly, Harambee Prosperity Plan-II for 2021-2025 identifies energy supply security through renewable energy (RE) resources as a key priority to achieve the intertwined economic and energy goals of the country. [19] The Economic Recovery Program,20 Green-Blue Namibia Economic Advancement Pillar published in December 2020 further underscores the role that Namibia's extensive RE resources can play in underpinning economic recovery. Although there is uncertainty about how the recent offshore oil and gas discoveries in the Orange Basin may affect the future energy mix of the country.

Namibia has excellent renewable energy resources. Installed renewable capacity (hydro, solar and wind) in the country is over 70 percent and the current share in the Fuel Mix is around 54%. Namibia has one of the highest solar irradiation levels in the world, as well as excellent wind resources. To date only limited scale solar generation has been incorporated into the domestic supply mix. RE development can reduce spending on electricity imports, expand domestic job creation, expand access to reliable and low-cost electricity, and help the country achieve its climate goals. The 2022 National Integrated Resource Plan (NIRP) made commitments of 2,850 MW of planned RE generation capacity plus 650 MW of BESS by 2040.

Namibia envisions driving a transformative green industrialization program to establish a low-carbon economy, with the aim to generating substantial employment opportunities for its citizens. By leveraging its world-class solar and wind resources, Namibia aims to become a major producer of clean green hydrogen molecules, which will be used domestically to create more complex compounds for decarbonizing hard-

[13] NamPower, Annual Report 2023. Not taking into account Skorpion Mine.
[14] National Integrated Resource Plan (2022). Available at: https://www.mme.gov.na/files/publications/611_NIRP_2022for_theElectricitySupplyIndustry_NamibiaSigned.pdf
[15] The variability in hydropower output due to water availability significantly affects the generation, especially during drought years. The country's dependence on hydropower makes it susceptible to variations in water availability, impacting both local generation and the need for imports. Interconnectors play a vital role in mitigating these challenges by providing access to regional electricity markets, ensuring a more stable and reliable energy supply.
[16] Capacity Factor <35% based on P50 scenario
[17] ECB, Annual Report (2023) 32% of imports from Zambia, 14% from ESKOM, 9% from Zimbabwe, and 3% from SAPP DAM
[18] Electricity Control Board Spark Newsletter, August-November
[19] Government of Namibia, Harambee Prosperity Plan II, https://hppii.gov.na/

to-abate sectors. Additionally, the country plans to utilize its deposits of critical metals and minerals, along with those of its neighbors, to develop a competitive green industrial economy that contributes to local, regional, and global decarbonization efforts. This strategic approach will favor green shoring by attracting private sector investments in the country, fostering economic growth and innovation. Namibia faces significant urbanization, driven by the lack of economic opportunities in rural areas, leading many to migrate to cities in search of better prospects. Green Industrialization can be a catalyst for the socio-economic development of the country, revitalizing rural economies through green energy initiatives (with RE representing a large portion of the targeted green industrialization value chain). By becoming a hub for green shoring, Namibia can significantly boost its economic growth, attract foreign investments, and create job opportunities in the clean manufacturing sector. This strategic approach will leverage renewable energy for (i) domestic use, (ii) regional trade opportunities and (iii) green industrialization.

2.1
Current Status, Opportunities and Challenges

PILLAR VI
GENERATION EXPANSION AND INVESTMENT IN INFRASTRUCTURE AT COMPETITIVE COSTS

Current Status

Namibia's electricity sector is at a pivotal moment, marked by growing demand for power and significant opportunities for infrastructure expansion. As of December 2024, the total installed capacity of electricity generation plants in Namibia stood at 695 MW. This capacity is distributed between NamPower, which is the national utility and owns 563.5 MW, and IPPs, which contribute 131.5 MW, predominantly from solar PV (126.5 MW) and wind (5 MW) sources. Despite this installed capacity, the fully firm capacity is only 140 MW, which is insufficient to meet the peak demand of 673 MW recorded in 2024. This demand is projected to nearly double to 1,243 MW by 2040, driven by rapid population growth and an increase in the number of households.

A significant portion of Namibia's local electricity generation, over 60%, is derived from hydropower resources. The Ruacana Hydropower Station, a 347 MW run-of-the-river facility owned by NamPower, is the cornerstone of this hydropower capacity. However, the reliability of hydropower has been impacted by recurrent droughts, likely exacerbated by global climate change. This has led to a reliance on electricity imports, which have accounted for 58-67% of annual demand over the past five years, rising to 90% in some cases. These imports come at a high cost, approximately three times the price of NamPower generation and 1.5 times that of local IPP generation, due to unfavorable US$-denominated Power Purchase Agreements (PPAs).

Thermal power, which accounts for about 30% of Namibia's generation mix, is provided by two thermal plants owned by NamPower: the 120 MW Van Eck plant (coal) and the 76.5 MW Anixas I and II plants (heavy fuel oil). These plants have high operating costs and are primarily used to cover peak and emergency supply needs.

Challenges

- **Reliance on High-Cost Imports Due to Insufficient Local Generation:** Increasing domestic generating capacity, is essential to reduce reliance on costly electricity imports, which are subject to regional power supply uncertainties. By reducing reliance on imports, Namibia can alleviate some of the financial strain on the electricity sector.
- **Foreign Exchange Risks:** The reliance on imports denominated in US dollars exposes Namibia to foreign exchange risks, which can lead to increased costs and financial instability.
- **Limited Implementation of the NIRP:** The current pace of implementing the National Integrated Resource Plan (NIRP) 2022 needs to accelerate to meet projected demand and generation targets. Increasing domestic generating capacity will reduce the need for imports, which are costly and subject to the uncertainties of regional power supply.
- **Comprehensive Planning and Climate Resilience:** A more comprehensive approach to planning that includes both generation, transmission and storage expansion, as well as the integration of climate resilience measures, will ensure robust and sustainable electricity sector planning. Integrating climate resilience into the NIRP is crucial due to the vulnerability of hydropower to droughts and climate variability.

Opportunities

- **Strategic Framework:** Namibia's National Integrated Resource Plan (NIRP) 2022 offers a strategic framework for addressing the country's energy challenges and unlocking its potential. The NIRP 2022, which updates the previous plan from 2016, covers a twenty-year planning period from 2022 to 2042, with investment plans extending to 2040.
- **Renewable Energy Expansion:** The NIRP 2022 base case emphasizes the expansion of renewable energy sources. It proposes the addition of 830 MW of solar PV, 1,546 MW of wind, and 650 MW of BESS by 2040, with significant milestones set for 2030. The goal is to reach around 80% renewable energy installed capacity and 70% in the energy mix by 2030.
- **Energy Security:** This expansion strategy presents an opportunity to reduce reliance on costly imports and enhance energy security through diversified and sustainable generation sources.
- **Regional Collaboration:** A consolidated perspective is critical, given the high dependence on the Ruacana Hydropower Station and similar hydrology regimes in neighboring countries like Zambia and Zimbabwe, which also face domestic rationing during dry periods.
- **Integrate Energy Efficiency in Energy Projects:** Developing and implementing an energy efficiency

program with clear objectives aimed for energy consumption by incorporating energy-efficient technologies and practices in new and existing projects will allow the reduction of electricity costs and environmental impact.

By leveraging its abundant solar and wind resources, Namibia can and diversified economy, enhancing its energy security and contributing to regional stability

PILLAR VII
INCREASED REGIONAL INTEGRATION

Current Status

Namibia's energy sector is currently characterized by a significant reliance on imports to meet its electricity demand. In the fiscal year 2022/23, the country imported over 2,400 GWh of electricity, primarily through PPAs with neighboring countries such as Zambia, South Africa, and Zimbabwe. These imports accounted for 54% of Namibia's electricity supply, with an additional 5% sourced from the Southern African Power Pool (SAPP) day-ahead market. Despite the increased output from the Ruacana Hydro Power Plant, Namibia remains structurally dependent on external power sources. This dependency presents both challenges and opportunities for the country's energy sector and its economic development. The country's commitment to advancing key interconnection projects and reinforcing its transmission infrastructure demonstrates a proactive approach to addressing current vulnerabilities and seizing future opportunities.

Challenges

Non-cost-reflective SAPP transmission pricing: Establishing cost-reflective transmission pricing is essential to incentivize investment from both public and private entities in transmission infrastructure. Ensuring high utilization of these investments will help reduce costs to consumers.

- **Network Congestion in neighboring countries:** Network congestion in neighboring countries can result in supply disruptions and increased costs. Namibia's aging transmission infrastructure is currently modern but has limited capacity. To fully leverage on regional power markets, it requires expansion to accommodate more variable renewable energy and trading opportunities. Namibia's strategic position along north-south trading routes highlights its potential.
- **Emerging Power Crisis:** The emerging power crisis in the SAPP region, driven by demand growth outpacing supply and exacerbated by increasingly severe climate impacts on hydropower resources, threatens the reliability of imports and poses a direct risk to Namibia's energy security.

Opportunities

- **Renewable Energy Potential:** Namibia is endowed with exceptional renewable energy resources, including some of the highest levels of solar irradiation in the world and significant wind potential. By harnessing these resources, Namibia can reduce its dependence on imports and potentially become an energy exporter. By leveraging its abundant solar and wind resources, Namibia can not only achieve energy self-sufficiency but also contribute to regional energy stability and economic growth.
- **Regional Energy Security:** Solar and wind energy can effectively complement the hydropower resources available in neighboring countries such as Angola, Zambia, and Zimbabwe. This complementary relationship can enhance regional energy security and stability, as well as provide economic benefits through energy trade.
- **Key Interconnection Projects:** The Namibian government has identified several key interconnection projects that can facilitate increased regional integration, including:
  - Obib–Oranjemond 400kV line to South Africa
  - ZIZABONA 330kV line to Zambia, Zimbabwe and Botswana
  - ANNA Kunene–Cahama–Lubango 400kV line to Angola
  - Botswana-Namibia (BONA) Interconnector to Botswana

These interconnections will enable the flow of hydroelectricity to the southern part of the Southern African Development Community (SADC) region, displacing fossil fuel generation and promoting the use of renewable energy sources. Developing an Action Plan in coordination with neighboring countries around prioritized regional trade scenarios will support Namibia in benefiting from regional trade opportunities.

Economic Benefits: The development of these interconnections will not only enhance Namibia's energy security but also position the country as a pivotal player in the regional energy market. ANNA is expected to unlock approximately 600 MW (2.23 TWh) of Angolan electricity based on hydropower, addressing part of the region's energy deficit while Namibia benefits from targeted regional trade and wheeling revenues.

PILLAR VIII
CLEAN AND AFFORDABLE LAST MILE ACCESS

Access to Electricity

Current Status

According to the 2023 census by the Namibia Statistical Agency, 59.5% of Namibian households have access to electricity. Of these, 46.9% use grid power, while 12.6% rely on off-grid energy solutions, particularly off-grid solar products ranging from Tier 0 and Tier 1. Urban areas have significantly higher electrification rates compared to rural areas, where most households still use candles, batteries, and firewood for lighting. The Geospatial Least Cost Electrification Plan (GLCEP) was formulated to outline pathways for achieving universal electricity access by 2040 through a combination of grid expansion and DRE solutions, particularly targeting underserved populations. The GLCEP study indicates that most households are situated within 2 km of existing grid infrastructure, offering a substantial opportunity for electrification through grid densification.

Challenges

- **Rapid Urbanization and Low Population Density**: Namibia's rapid urbanization and low population density present challenges for expanding access to electricity and increasing the cost of electrification.
- **Negative Public Perception of Off-grid Solar Solutions**: Given the low population density, DRE can be an effective solution for improving access to electricity. However, the private sector's role in DRE is currently limited, and public perception of DRE solutions is often negative. Although the National Electrification Strategy (NES) and the National Electrification Least Cost Plan (NELFP) have been established, they are not yet operationalized.
- **Affordability**: Households encounter difficulties related to the affordability of grid connections, internal wiring, and the substantial upfront costs associated with off-grid solar solutions.
  - Extending the grid to sparsely populated areas incurs high costs, posing a significant financial hurdle. Addressing affordability for connection and internal wiring costs is essential, with potential solutions including tariff incorporation, government subsidies, or improved consumer financing options. Due to the cost-reflective tariff, Namibia has one of the highest electricity tariffs in Africa, making affordability crucial for scaling up electrification efforts.
  - Consumer financing options are also limited, making it difficult for rural households to afford solar home systems. The Solar Revolving Fund, for instance, provides funding primarily to banked and employed individuals, leaving the unbanked and unemployed without access to financing. Furthermore, the high upfront costs of off-grid solutions make them unaffordable for many households without subsidies or flexible payment plans.
- **Technical Constraints:** Technical constraints within the grid infrastructure require detailed load flow analysis or power system assessments to manage additional connections and increased demand effectively. Furthermore, Namibia's rapid urbanization necessitates meticulous planning by the government to accommodate the growing urban population needs.
- **Limited capacity of small local companies:** Small local off-grid solar and clean cooking solution companies often struggle to scale, attract investment, and expand services.

Opportunities

- **Private Sector Engagement:** There is potential for private sector engagement, which could enable local, and potentially international companies, to explore opportunities in investing in standalone solar systems, mini-grids, and productive use of energy solutions.
- **Innovative Business Models:** Innovative business models like Pay-As-You-Go (PAYGo), supported by mobile money services like MTC, can make payments more manageable, thereby enhancing affordability and access to off-grid solar solutions.
- **Quality Standards and Awareness:** Establishing and enforcing quality standards for solar products will build consumer trust and improve system performance. Community sensitization and consumer awareness campaigns can increase adoption, particularly in rural electrification areas. Civil society organizations can play a crucial role in supporting stakeholder dialogues and providing civic education on the benefits of energy solutions.

Access to clean and improved cooking

Current Status

Based on the 2023 National Census data, 48.5% of households nationally use clean cooking solutions (i.e., the use of electricity, gas, or solar energy for cooking), while the remaining 51.5% rely on traditional cooking solutions. Urban households demonstrate much higher clean cooking access at 77.1%, driven largely by electricity

(55.1%) and gas (21.8%). Conversely, rural areas lag far behind, with just 13.8% of households using clean fuels and a heavy reliance on firewood (84.6%) and other polluting fuels[20]. This disparity underscores the urgent need to expand access to clean cooking solutions particularly in underserved rural communities.

Challenges

- **Policy and institutional gaps:** Clean cooking remains absent from Namibia's national energy and climate strategies, resulting in a lack of political prioritization, funding mechanisms, and policy direction. Weak coordination across ministries and agencies further undermines the effective implementation of clean cooking programs.
- **Market and investment barriers:** The clean cooking sector in Namibia is not fully commercially viable. There are few investable businesses, limited access to financing, and insufficient incentives for private sector engagement. High costs, long payback periods, and lack of consumer demand discourage innovation and scalability.
- **Lack of standards, testing, and local production:** Namibia lacks national standards and certification systems for clean cooking technologies, as well as testing facilities to ensure product performance and safety. Most technologies are imported, with limited local manufacturing or supply chain infrastructure, making products more expensive and less accessible.
- **Low consumer awareness and affordability challenges:** Many households, particularly in rural areas, are unaware of the health and economic benefits of clean cooking. High upfront costs, limited income, and expensive transport in remote regions create major affordability barriers, especially in communities most dependent on traditional fuels.
- **Gender, health, and data neglect:** The significant health impacts of traditional cooking, especially for women and children, are often overlooked in program design. At the same time, Namibia lacks comprehensive data on household energy use, impeding effective planning, monitoring, and investment targeting in the clean cooking sector.

Opportunities

- **Untapped rural market potential:** The stark contrast between high urban uptake (77.1%) and low rural adoption (13.1%) of clean cooking solutions presents a clear opportunity for targeted rural interventions. Expanding access to electric, gas, and solar cooking in underserved rural areas could yield high-impact results, particularly through decentralized energy solutions and behavior change campaigns tailored to rural needs.
- **Growing political momentum and donor alignment:** Rising national and regional awareness of clean cooking, coupled with increased advocacy and alignment with global development and climate goals, creates a timely window for policy integration. Strengthened coordination among government institutions and development partners can drive the mainstreaming of clean cooking into national energy and climate agendas.
- **Innovative financing mechanisms:** Innovative financing mechanisms such as carbon finance, results-based financing (RBF), blended capital, and targeted subsidies present a powerful opportunity to scale clean cooking solutions in Namibia. Carbon finance allows clean cooking projects to earn revenue by generating and selling carbon credits from reduced emissions, creating a sustainable funding stream aligned with Namibia's climate goals. RBF links funding directly to verified outcomes, such as adoption and continued use of clean technologies, thereby incentivizing efficiency and attracting private sector engagement. Blended finance, which merges concessional and commercial capital, helps de-risk investments and make early-stage or high-impact projects more bankable. Meanwhile, well-designed subsidies can address affordability barriers for low-income and rural households, ensuring broader adoption without fostering long-term dependency. Together, these financing tools can catalyze investment, improve affordability, and build a more resilient and inclusive clean cooking market.
- **Emerging local enterprises and skills development opportunities:** A growing ecosystem of early-stage clean cooking and off-grid energy enterprises, though still nascent, represents a foundation to build on. With targeted support for entrepreneurship, business incubation, and localized manufacturing, Namibia can develop a self-sustaining market. Equally, investing in workforce development through training in technical, managerial, and operational skills will be critical to scaling solutions sustainably.

Gender Inclusion

As a cross-cutting need, incorporating gender inclusion requires an integrated, multi-sectoral strategy grounded and informed by the Namibian Gender Policy. The Namibian Gender Policy reaffirms the GRN's commitment to the principles of gender equality as articulated in the National Gender Policy, the National Development Plans (NDPs), and Vision 2030.

[20] Namibia 2023 Population and Housing Census

To achieve these objectives:

- Municipalities shall adopt Gender-Responsive Planning and Budgeting (GRPB) tools in the formulation of strategic plans and annual budgets. Local councils will be supported to conduct gender analysis and apply gender budgeting principles to ensure equitable resource distribution.
- All activities shall be monitored using sex-disaggregated data and gender-sensitive indicators. Annual performance reviews will assess progress against specific gender outcomes, including access to services, safety, employment, and participation.
- Participatory planning processes will be inclusive of women, youth, and marginalized groups. Municipalities shall establish inclusive community forums and utilize tools such as participatory gender audits and community scorecards to enhance social accountability.

PILLAR IX
INCENTIVIZE PRIVATE SECTOR PARTICIPATION TO UNLOCK ADDITIONAL RESOURCES

Current Status

Namibia's private sector plays a crucial role in advancing the country's development goals, particularly in renewable energy and green industrialization. Recognizing the importance of increasing domestic electricity supply and reducing dependency on imports, the GRN has made a significant policy decision to procure both public and private investments in electricity generation. Despite the potential, private investment across the energy value chain currently remains limited. The private sector has developed 131.5 MW of renewable energy capacity, primarily through solar PV and wind projects under the IPP model. These projects have been instrumental in harnessing Namibia's abundant solar and wind resources, contributing to the country's renewable energy portfolio. Currently, there is no private sector involvement in transmission infrastructure.

Challenges

- **Limited Private Investment:** Despite the potential for growth and strong interest from the private sector, private investment across the energy value chain remains limited. The sector could leverage the private sector to complement public sector investment and accelerate the rate of locally produced energy and increased regional trade flows..
- **Slow Uptake of MSB Model:** The Modified Single Buyer (MSB) Model in Namibia allows direct transactions between large electricity consumers and IPPs, facilitating private sector involvement in energy generation. However, the slow uptake of the MSB model has limited its effectiveness in creating a competitive and efficient electricity market.
- **Regulatory and Financial Barriers:** Challenges such as the lack of foreign exchange currency variation protection and absence of tax incentives for Distributed Renewable Energy (DRE) solutions hinder further private sector investment. Additionally, land mobilization and licensing issues pose significant barriers.

Opportunities

- **Private Sector Involvement in Electrical Infrastructure:** By enabling and engaging the private sector in the development of regional interconnectors and key domestic links, Namibia can accelerate the expansion of import / export transfer capacity and increase regional energy trade. This involvement can foster greater collaboration, accelerate the development of the needed infrastructure to achieve 2030 goals, and integration within the energy sector, ultimately benefiting the broader regional economy.
- **Enhancing Regulatory Frameworks:** Opportunities exist to enhance private sector participation by addressing existing challenges. Strengthening the regulatory and tendering frameworks is a critical step in creating a more favorable environment for private investment. This includes reviewing and potentially revising the MSB model to increase private generation.
- **Concessional Financing and Incentives:** Providing concessional financing to reduce the cost of capital for renewable energy projects can attract more private investment. Additionally, operationalizing the green industrialization strategy of the country can support Namibia in creating jobs and promoting sustainable industrial growth.
- **Transition to a Diversified Economy:** By leveraging its natural resources and creating a conducive environment for private investment, Namibia can transition to a sustainable and diversified economy, enhancing its energy security and contributing to regional stability.

PILLAR X
WORK TOWARDS FINANCIALLY VIABLE UTILITIES THAT PROVIDE RELIABLE SERVICE

Namibia's electricity sector is on a transformative path, aiming to overcome financial and operational challenges to ensure reliable and sustainable service delivery. The overarching objective is to reduce the cost of electricity,

particularly by decreasing reliance on imports and enhancing efficiency. This involves addressing current financial issues, optimizing operational efficiencies, and leveraging opportunities for improvement.

Current Status

The electricity sector in Namibia is governed by the Electricity Act 4 of 2007, with tariff regulation managed by the ECB. Tariffs are determined using a cost-plus methodology, ensuring utilities cover operational costs and earn a regulated return on assets. The current tariff structure aims to be cost-reflective, representing the Long-Run Marginal Cost (LRMC) of supply.

NamPower

NamPower, the national power utility, plays a crucial role in electricity generation and transmission in the country. It also operates medium-voltage distribution lines and serves as a bulk electricity supplier to electricity distributors. NamPower has demonstrated steady revenue growth from 2020 to 2024, driven by increased sales volumes and tariff adjustments. However, it faces financial pressure due to high reliance on costly electricity imports, which accounted for 58.20% and 48% of supplied electricity in FY2023 and FY2024, respectively. This reliance creates financial uncertainty and pressure due to high import costs and associated forex risks.

Distributors

The electricity distribution and retail segment in Namibia comprises five Regional Electricity Distributors (REDs), with three currently operational - Northern Regional Electricity Distribution Company (NORED), Central-Northern Regional Electricity Distribution Company (CENORED), and Erongo RED - along with Local Authorities and Regional Councils. They play a crucial role in expanding access to electricity, particularly in rural and underserved areas. Additionally, the City of Windhoek (COW) serves the nation's capital. REDs encounter various operational and financial challenges, including the need to enhance customer service systems and update infrastructure. These areas require attention to ensure continued reliability and minimize potential supply disruptions.

Performance-Based Regulation (PBR)

The transition to Performance-Based Regulation (PBR) is a key strategy in aligning tariffs with performance metrics, promoting efficiency and cost-effectiveness. However, this transition faces challenges due to the existing Cost-Plus tariff methodology, which limits the sector's ability to adapt swiftly to evolving economic conditions. The periodic adjustment of revenue requirements further complicates this transition, necessitating a robust regulatory framework to ensure that tariff structures remain affordable while accurately reflecting costs. Insufficient regulatory oversight and compliance highlight the need for the ECB to implement comprehensive oversight procedures that ensure adherence to quality of supply and service standards.

Challenges

- **Regulatory Transition:** The shift from Cost-Plus to PBR is hindered by existing methodologies and insufficient regulatory oversight, complicating tariff adjustments and compliance with quality standards.
- **Financial and Operational Strain:** NamPower faces significant financial challenges, including high expected credit losses and outstanding debt, which impact cash flow and operational efficiency. The variability in hydropower output and high costs of the energy mix further exacerbate these issues.
- **Distribution Network Management:** Distributors face challenges related to performance reporting and financial volatility. The lack of available information on the performance of low-voltage networks hinders effective management and customer service.
- **Challenge to balance existing cost recovery with affordability**
- **Underutilization of smart and digital solutions** to improve grid reliability and operational efficiency

Opportunities

- **Regulatory Framework Enhancement:** Strengthening the regulatory framework to support the transition to PBR can promote efficiency and cost-effectiveness in tariff structures, ensuring affordability and quality service delivery.
- **Renewable Energy Investments:** NamPower's focus on increasing local generation capacity through renewable energy projects presents an opportunity to reduce import dependency and stabilize the energy mix. Implementing prepaid meters and systems can enhance revenue collection and mitigate financial challenges.
- **Advanced Technologies in Distribution:** Incorporating advanced technologies such as Outage Management Systems (OMS) and condition-based maintenance (CBM) can enhance network monitoring and customer service. Optimizing commercial processes and expanding customer connections can improve financial stability and contribute to socio-economic development.

Digitalization and AI

Any action taken will require modern tools to help fast-track the ambition. Digitization can significantly accelerate Namibia's electrification rate by enabling smarter planning, more efficient grid operation, innovative off-grid solutions, better governance, and diversified financing models. However, this requires concerted investments in digital infrastructure, human capacity development, and a regulatory framework that supports digital innovation in the energy sector.

The inclusion of Artificial Intelligence (AI) where appropriate, significantly enhances the value proposition of digitalization in accelerating Namibia's electrification (access) rate. AI technologies can optimize energy planning, enhance predictive maintenance, improve customer service delivery, and enable more precise and adaptive energy management, particularly in peri-urban and remote communities. A good example of this is the current usage of GIS-based mapping which can facilitate better evidence-based decision-making to prioritize activities.

ANNEX I
METRIC OF KEY INDICATORS

Pillars	Metrics /Indicators	Data (latest available)
Pillar 1 – Expand Generation and T&D Networks	• **Generation Capacity Installed / Available** (MW) by 2024 (Thermal, Renewable) • Average annual growth rate (%) (of last 3 years)	• 695 MW installed • Hydro (50%); • Natural gas (0%); • HFO, coal and diesel (28%); • Biomass and co-generation (0). • Solar PV and Wind (22%) • Annual growth rate 4%[21]
	Energy Produced Annually (GWh) – Total by 2024 (Thermal, Renewable) Average annual growth rate (%) (of last year) Average Cost per kWh – Thermal, Renewable Imports	• 2,176 GWh (locally) • 54%, of which 81% hydro 2% Thermal 3% PV (NamPower) and 14% PV (IPP) • Average annual growth rate 53%[22] • 0.117$/kWh[23] • 46%
	• **Energy Imported Annually** (GWh) – Total by 2024 • Average annual growth rate (%) (of last years) • Average cost per kWh (US$)	• 2,139 GWh • -12% • 0.117US$/kWh[24]
	• **Energy Exported Annually** (MWh) – Total • Average annual growth rate (%) (of last 3 years) • Total revenue (US$)	• N/A
	• **Transmission Network** (HV, MV), Total: Length (km); Voltage (kV)	• Total HV: 12,043 km • 400 kV AC – 1,466 km; • 350kV HVDC – 953km • 330kV AC – 522 km • 220 kV AC – 3,207 km; • 132 kV AC – 2,308 km; • 66-kV AC – 3,587 km;
	• **Distribution Network (LV), Total**: Length (KM); Voltage (KV)	Total MV: 22,977 km • NamPower: • 33kV: 12,250 km

[21] VRE Contracted with NamPower
[22] Linked to the rain and the production of the Ruacana Hydropower
[23] Total tariff for Namibia, combining import and own generation.
[24] Ibid

		• 22kV: 4,947 km • 19kV SWER: 4,633 km • 11kV: 1,148 km
	• Number of new on-grid connections (by customer type)	
	2022 **2023**	**2024**
	Residential, commercial, industrial, mining, etc. 1,221 29,968	N/A
Pillar 2: Regional integration	• **Transmission Interconnectors** (HV), Total: Length (KM); Voltage (KV): Transfer Capacity – MW	• 350kV HVDC, 953 km, 300MW • 400kV AC, 600MW
	• Energy traded in Bi-lateral Power Purchase Agreements / MOU:	2,201 GWh
	• Energy Traded in Power Pool:	39 GWh
	• Transmission Wheeling Charges (US$ per kWh)	N/A
	• Payables (arrears) / Receivables (US$)	N/A
Pillar 3: DRE / Clean Cooking	• Number of households purchase an off-grid solar product (between 2011-2023)	Households: 93,786 households in 2023 and 5,578 households in 2011
	• Number of Clean Cooking Connections	• 2011: 213,826 Households (46%) • 2023: 319,931 Households (42.3%)
Pillar 4: Private Sector Participation	• Total Investment Required to Meet 2030 Compact Goals / Targets - Public / Private. • Total Investment Available as of 2024 – Public / Private) • Investment Gap to be mobilized each year up to 2030 - Public / Private (based on Government priorities and sequencing) (Domestic and International)	• US$ 1,764 M (public US$ 1,353 M / private US$ 411 M) • Secured funding US$ 718 M (public US$ 562 M / private US$ 156 M) • Gap US$ 1,056 M (public US$ 791 M / private US$ 255 M)
	• Total (Private) investment needs by 2030 (US$, percentage) -split (by Grid, mini-grid, off-grid) and clean cooking); spilt (by generation, transmission, distribution and access) (Domestic and International)	• US$ 411 M; Generation US$ 390 M (PV and Wind), Off-grid US$ 21 M
Pillar 5: Sector Reforms and Sustainable Utilities	• Utility financial profitability (per audited accounts) – Net income/loss (US$ amount and US$/kWh) for NamPower, REDs (Nored, Cenored, Erongo RED), CoW	NamPower • US$ 76 M (profit, after tax) in 2024, 48 M (loss, after tax) in 2023[25] • Cost 0.113 US$/kWh (2024)
	• (Regulator) Tariff policy, average end-user tariffs (per kWh) (cost reflective tariff)	• US$ 0.117 kWh (NamPower)
	• Total Subsidy Amount (US$)[26;]	• NA
	• Aggregate Technical Commercial & Collection (ATCC) Losses:	• Current NamPower 11.1%

[25] NamPower Annual Report 2024

[26] This could include subsidies for electricity generation, distribution, renewable energy projects, and consumer subsidies.

	• Number of metered customers • Number of prepayment meters	• NamPower 3,618 metered customers as of December 2024 • N/A
	• Load shedding (e.g. average number of hours per day and/or estimated lost MWh per annum).	• 0 MWh
Additional - Cross-Cutting for consideration	• Capacity Building requirements (US$) (at all levels) • Alignment of Power Sector Least Cost Expansion Plans to country Long Term Strategies and NDCs /Paris Agreement – Yes/No • Household Affordability (i.e. % level of household disposable income available to be spent on energy services and/or % of Households Receiving Energy Subsidies) • Jobs: e.g. Track the number of jobs created for Youth and Women	• US$ 20 M • 6,000 jobs (direct and indirect)

ANNEX II
PROJECTS & INVESTMENT NEEDS

Last Mile Projects							
Description	**Responsible Party**	**Locality**	**Number of connections**	**Total required (US$)**	**Utility /Third party (US$)**	**GRN (US$)**	**Funding gap (US$)**
Expand the grid to 176,826 Households	NORED	Rural	9,000	211,475,410	10,928,962	8,196,721	195,081,967
		Peri-Urban	81,000				
	CENORED	Rural	1,500	30,737,705	3,551,913	5,464,481	21,721,311
		Peri-Urban	13,500				
	ERONGORED	Rural	1,950	23,073,391	3,278,689	5,464,481	14,330,222
		Peri-Urban	5,150				
	AU-OB	Rural	330	16,013,115	1,202,186	5,027,322	9,783,607
		Peri-Urban	6,270				
	CoW	Rural	3,056	69,772,131	9,040,000	9,040,000	51,692,131
		Peri-Urban	52,070				
	OPE	Rural	280	6,424,044	819,672	2,732,240	2,872,131
		Peri-Urban	2,720				
Expand off-grid connections to 34,000 Households and SMEs	MIME / NORED / PS	Rural	21,850	22,434,426	15,704,098	4,486,885	2,243,443
		Peri-Urban	1,150				
	MIME / CENORED / PS	Rural	5,700	5,852,459	4,096,721	1,170,492	585,246
		Peri-Urban	300				

Last Mile Projects							
Description	**Responsible Party**	**Locality**	**Number of connections**	**Total required (US$)**	**Utility /Third party (US$)**	**GRN (US$)**	**Funding gap (US$)**
	MIME / ERONGORED / PS	Rural	3,800	3,901,639	2,731,148	780,328	390,164
		Peri-Urban	200				
	MIME / AU-OB / PS	Rural	1,425	1,463,115	1,024,180	292,623	146,311
		Peri-Urban	75				
	MIME / CoW / PS	Rural	475	487,705	341,393	97,541	48,770
		Peri-Urban	25				
	MIME / OPE / PS	Rural	380	390,164	273,115	78,033	39,016
		Peri-Urban	20				
Roll-out clean cooking technology to 200,000 households	MIME / NORED / PS / CS	Rural	114,000	9,672,131	6,770,492	1,934,426	967,213
		Peri-Urban	6,000				
	MIME / CENORED / PS /	Rural	38,000	3,224,044	2,256,831	644,809	322,404
		Peri-Urban	2,000				
	MIME / ERONGORED / PS / CS	Rural	9,500	806,011	564,208	161,202	80,601
		Peri-Urban	500				
	MIME / AU-OB / PS / CS	Rural	38,000	3,224,044	2,256,831	644,809	322,404
		Peri-Urban	2,000				
	MIME / CoW / PS / CS	Rural	28,500	2,418,033	1,692,623	483,607	241,803
		Peri-Urban	1,500				

Last Mile Projects							
Description	**Responsible Party**	**Locality**	**Number of connections**	**Total required (US$)**	**Utility /Third party (US$)**	**GRN (US$)**	**Funding gap (US$)**
	MIME / OPE / PS /CS	Rural	2,850	241,803	169,262	48,361	24,180
		Peri-Urban	150				
Finalise and implement NES	MIME, NamPower, ECB, Dx			27,322	10,929	5,464	2,732
Operationalise the electrification fund	MIME, NamPower, ECB, Dx, Financial institutions			109,290	76,503	21,858	10,929
Network upgrades	NORED, NamPower, ECB			23,333,333	4,666,667	2,333,333	16,333,333
	CENORED, NamPower, ECB			23,333,333	4,666,667	2,333,333	16,333,333
	ERONGORED, NamPower, ECB			8,196,721	1,639,344	819,672	5,737,705
	AU-OB, NamPower, ECB			2,732,240	546,448	273,224	1,912,568
	CoW, NamPower, ECB			13,661,202	2,732,240	1,366,120	9,562,842
	OPE, NamPower, ECB			2,732,240	546,448	273,224	1,912,568
All Dx to develop Master Plans based on inputs from NES and Funding Portfolio	NORED, NamPower, ECB			65,574			45,902
	CENORED, NamPower, ECB			65,574			45,902
	ERONGORED, NamPower, ECB			65,574			45,902

Last Mile Projects							
Description	**Responsible Party**	**Locality**	**Number of connections**	**Total required (US$)**	**Utility /Third party (US$)**	**GRN (US$)**	**Funding gap (US$)**
	AU-OB, NamPower, ECB			65,574			45,902
	CoW, NamPower, ECB			65,574			45,902
	OPE, NamPower, ECB			65,574			45,902
Total			**455,226**	**486,130,495**	**81,587,568**	**54,174,590**	**157,892,380**

Project Implementer	**Project Description**	**Funding**
Northern Regional Electricity Distributer	Organize multi-sector engagement across regions to understand local energy needs and map out community-level priorities.	Hans Siedel to advise
Development of Civic and Energy Education Curriculum	Integrate clean energy and civic education into Namibian school curricula to foster awareness of energy usage, sustainability, and affordability.	Hans Siedel to advise
Pilot Off-Grid Electrification	Deploy solar home systems and small mini-grids in rural and remote communities; includes awareness and payment model testing.	TBD
Technical and Business Model Development for Clean Cooking	Design and pilot scalable business models for clean cooking technologies, especially for rural households.	TBD
Gas-to-Power Use Case Feasibility Study	Assess potential use of offshore gas for power generation to complement renewables and support baseload needs.	TBD
Knowledge Transfer from ProCEED Mini-Grid Project	Host webinars and documentation reviews to extract learnings from the ProCEED project and apply them to new initiatives.	In-kind (existing project resources)
Stakeholder Dialogues on Off-Grid Electrification	Organize multi-sector engagement across regions to understand local energy needs and map out community-level priorities.	Hans Siedel to advise

Project Implementer	Project Description	Funding
Development of Civic and Energy Education Curriculum	Integrate clean energy and civic education into Namibian school curricula to foster awareness of energy usage, sustainability, and affordability.	Hans Siedel to advise
Technical and Business Model Development for Clean Cooking	Design and pilot scalable business models for clean cooking technologies, especially for rural households.	TBD
Gas-to-Power Use Case Feasibility Study	Assess potential use of offshore gas for power generation to complement renewables and support baseload needs.	TBD
Knowledge Transfer from ProCEED Mini-Grid Project	Host webinars and documentation reviews to extract learnings from the ProCEED project and apply them to new initiatives.	In-kind (existing project resources)

Generation Projects						
Project Name	Timeline	Project Description	Funding Requirement	Secured Financing	Status	Ownership
Otjikoto Biomass Project **(New)**	2027	Development of a biomass power plant 40 MW in Otjikoto	US$ 160 million	Yes	Under construction	NamPower
Rosh Pinah **(New)**	2026	Development of 100 MW solar PV	US$ 70 million	Yes	Under construction	NamPower
Omburu **(New)**	2027	Development of 80 MW solar PV	US$ 56 million	No	Implementation stage	NamPower

Khan Project **(New)**	2025	Development of 20 MW solar PV	US$ 14 million	Yes	Under construction	IPP
Diaz **(New)**	2026	Development of 44 MW wind in Luderitz (including transmission connection)	US$ 66 million	Yes	Under construction	IPP
Cerim **(New)**	2026	Development of 50 MW wind in Luderitz (including transmission connection)	US$ 76 million	Yes	Under construction	IPP
PV Projects (GRN Determination) **(New)**	2028	Development of 120 MW solar PV	US$ 84 million	No	Concept stage	IPP
Baynes Hydro Project **(New)**	2031	Development of 880 MW hydro power plant (440 MW Namibia – 440 MW Angola)	US$ 1.6 billion	No	Feasibility Study completed	TBD
Wind Project **(New)**	2030	Development of 150 (300) MW wind park	US$ 150 million	No	Feasibility Study ongoing	TBD

Transmission Projects

Project Name	Timeline	Project Description	Funding	Secured Financing	Status	Ownership
TEES Project	2028	Construction of 400kV Kokerboom-Auas transmission line (grid stabilization)	US$ 110 million	Yes	Under implementation	NamPower

(Transmission Expansion and Energy Storage Project) **(New)**						
3rd Namibia-RSA Interconnector (regional integration project) **(New)**	2026	Construction of 400kV Obib-Oranjemond Interconnector (grid stabilization)	US$ 65 million	Yes	Under construction	NamPower
Omburu BESS **(New)**	2027	Development of Omburu BESS 54MW/54MWh (grid stabilization)	US$ 27 million	Yes	Under construction	NamPower
Lithops BESS **(New)**	2028	Development of Lithops BESS 45MW/90MWh (grid stabilization)	US$ 35 million	Yes	Under implementation	NamPower
220/66kV Khomas substation **(New)**	2026	Development of 220/66kV substation to reinforce supply to Windhoek	US$ 18 million	Yes	Under construction	NamPower
220/kV Erongo substation **(New)**	2026	Development of 220/66kV substation to reinforce and serve new mining loads	US$ 9 million	Yes	Under construction	NamPower

132/66/33kV Sekelduin substation **(New)**	2025	Development of 132/66/33kV substation at the central coast to serve increased loads	US$ 17 million	Yes	Under construction	NamPower
132kV Namib-Diaz and Cerim line **(New)**	2025	Construction of 132kV line to Diaz and Cerim Wind Parks	US$ 12.9 million (Included under IPP generation project)	Yes	Under construction	NamPower
220/132kV Masivi substation **(New)**	2025	Development of 220/132kV substation to cater for load growth	US$ 17.8 million	Yes	Under construction	NamPower
400 kV ANNA Interconnector Project (regional integration project) **(New)**	2029	Construction of 400kV Angola-Namibia Interconnector (transmission line to Angola + statcom + substation)	US$ 60 million	No	Feasibility Study Completed	NamPower
400 kV Omatando Otjikoto line and substations **(New)**	2029	Construction of 400kV transmission line + substation extension at Gerus (grid stabilization + load flow)	US$ 75 million	No	Feasibility Study to be undertaken	NamPower
330 kV ZIZABONA Interconnector (regional integration project)	2027	Construction of 330kV Zimbabwe-Zambia-Botswana-Namibia Interconnector (small amount as limited scope)	TBD	No	Feasibility Study to be undertaken	TBD

(New)

400 kV Namibia-Botswana Interconnector (regional integration project) **(New)**	2027	Construction of 400kV Namibia-Botswana Interconnector	TBD	No	Pre-Feasibility Study to be undertaken	TBD

ANNEX III
ONGOING ACTIVITIES AND SUPPORT FROM DEVELOPMENT PARTNERS

Development Partner	Project Name	Timeline	Project Description	Funding (including from the private sector)
World Bank	Transmission Expansion and Energy Storage Project (TEES)	2024-2029	Financing of (i) 400kV Kokerboom-Auas transmission line, (ii) Lithops BESS 45MW/90MWh and (iii) capacity building program	US$ 100 million IBRD loan US$ 38.5 trust fund US$ 10 million counterpart funding
KfW	Omburu BESS	2026	Installation of 58MWh 1 hour BESS at Omburu Transmission Station	US$ 22 million grant US$ 5.4 million counterpart funding
KfW	Rosh Pinah Solar PV	2027	Development of 100MW Solar PV	US$ xx million loan US$ xx million counterpart funding
AFD	Otjikoto Biomass	2027	Development of 40MW Biomass power plant	US$ 111 million loan US$ 27.7 million mitigation action facility (grant) US$ 21.6 million GRN contribution

ANNEX IV
OPERATIONAL INDEPENDENT POWER PRODUCER (PRIVATE SECTOR INVESTMENT)

Licensee	Installed Capacity (MW)	Technology	Sub-category
Ejuva One Solar Energy (Pty) Ltd	6.032	Solar PV	REFIT
Ejuva Two Solar Energy (Pty) Ltd	6.032	Solar PV	REFIT
Camelthorn Business Venture No Two (Pty) Ltd	6.5	Solar PV	REFIT
Momentous Solar One (Pty) Ltd	6	Solar PV	REFIT
HOPSOL Power Generation (Pty) Ltd	5.73	Solar PV	REFIT
Sertum Energy (Pty) Ltd	5.76	Solar PV	REFIT
Aloe Investment No. 27 (Pty) Ltd	5.67	Solar PV	REFIT
ALCON Consulting Services (Pty) Ltd	6.318	Solar PV	REFIT
Ombepo Energy (Pty) Ltd	6	Wind	REFIT
Osona Sun Energy (Pty) Ltd	6.696	Solar PV	REFIT
Metdecci Energy Investment (Pty) Ltd	5.28	Solar PV	REFIT
Tandii Investment (Pty) Ltd	5.73	Solar PV	REFIT
NCF Energy (Pty) Ltd	5.73	Solar PV	REFIT
Unisun Energy (Pty) Ltd	5.74	Solar PV	REFIT
GreeNam Electricity (Pty) Ltd (Kokerboom)	12.636	Solar PV	Unsolicited IPPs
GreeNam Electricity (Pty) Ltd (Hardap)	12.636	Solar PV	Unsolicited IPPs

Omburu Sun Energy (Pty) Ltd	5.197	Solar PV	Unsolicited IPPs
Sun EQ Four Investments (Pty) Ltd	6.574	Solar PV	Solicited IPPs
OLC Arandis (Pty) Ltd	3.8	Solar PV	Solicited IPPs
HOPSOL Power Generation (Pty) Ltd	5.61	Solar PV	Solicited IPPs
Alten Solar Power (Hardap) (Pty) Ltd	45.454	Solar PV	Solicited IPPs
Namib Poultry Industries (Pty) Ltd	3.087	Solar PV	MSB
Rosh Pinah Solar Park (Pty) Ltd	5.682	Solar PV	MSB
Skeleton Coast Trawling (Pty) Ltd	2.593	Solar PV	MSB
Namibia Breweries Limited (Pty) Ltd	1.17	Solar PV	MSB
CGN Renewable Energy (Namibia) Pty Ltd	12	Solar PV	MSB
Total	199.7		
Source: Electricity Control Board			

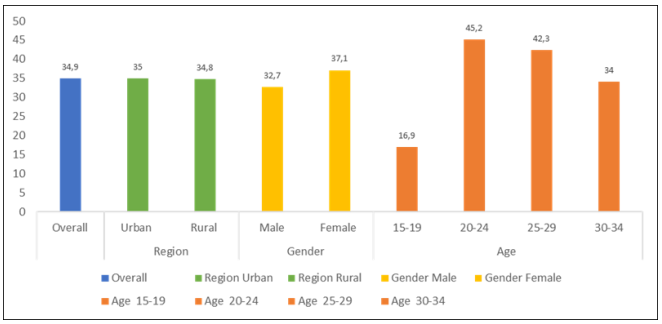
ANNEX V
MAXIMIZING SOCIO-ECONOMIC BENEFITS: JOBS, SKILLS DEVELOPMENT, LOCAL ECONOMIC AND COMMUNITY DEVELOPMENT

Current context of the labor market

Namibia, with a population of 3 million, has achieved political stability and sound economic management, which have anchored poverty reduction efforts and elevated the country to upper-middle-income status. Rich in mineral resources such as diamonds and uranium, mining contributes approximately 10% to the gross domestic product (GDP). Despite these achievements, socio-economic inequalities inherited from the apartheid era remain high, and structural constraints continue to impede job creation. Progress in reducing inequality has been slow, making Namibia one of the most unequal countries globally, although the Gini index has declined from 63.3 in 2003 to 59.1 in 2015.

Namibia's labor market is characterized by high informality, unemployment rates, and inactivity. Less than half (47 percent) of the working age population (WAP) was employed in 2018, and of those in employment, 58 percent were in informal jobs. While low private sector dynamism partly explains the high unemployment rates, these also reflect low skills and mismatches between the skills demanded by employers and those supplied by job seekers. Labor market outcomes are particularly weak among youth. Among youth between 15 and 34 years-of-age, 35 percent were not in employment, education or training (NEET). The share of NEETS is higher among women than among men (37 percent and 33 percent, respectively), and particularly high among youth in the age groups from 20-24 years (45 percent) and 25-29 years (42 percent).

Figure 1. Youth Not in Education, Employment or Training (2018, % of youth)



(Source: The Namibia Labor Force Survey 2018)

Opportunities

The development of new renewable energy investments, the connection of additional households to electricity, and move towards clean cooking stoves, will have a profound impact on local economies, particularly in rural and underserved areas. These projects bring in substantial investments, create jobs, and generate additional income for local businesses and communities. By providing clean, affordable energy, these investments improve the quality of life for residents and create opportunities for local development.

New job opportunities arising from the Compact: There will be additional job opportunities that will arise in the construction and operational phases of increasing energy generation and transmission related to the following investments under the Compact: (i) scaling up renewable energy to add 454MW of additional installed capacity by 2030, from solar, wind, hydro, and biomass sources; (ii) connecting an additional 210,000 households through on-grid and off-grid solutions and (iii) enhancing access to clean cooking solutions for 200,000 households by 2030 .

New job opportunities arising from Renewable Energy Infrastructure: There will be job creation through direct employment opportunities as renewable energy projects such as solar and wind farms are constructed and operated, a significant number of workers are needed to carry out various tasks such as installation and maintenance of equipment, monitoring energy production, and ensuring safety standards are met. In addition, the renewable energy sector also generates numerous indirect employment opportunities such as manufacturing and assembly of solar panels and wind turbines to transportation, logistics, and consulting services. There will also be induced jobs created as the revenues from these investments are invested to provide

the services needed in a community such as restaurants, lodging, and transport.

The labor-intensity of these investments vary by the type of renewable investment, e.g. solar PV is more labor intensive than wind, and wind is more labor intensive than hydro and biomass sources. There is also a time-factor affecting the number of jobs required, with more people being employed in the construction period and less in the operations and maintenance period. While there are estimates of jobs created per $1m investment in wind and solar from other countries, particularly the US [27], similar estimates scant in the Africa region. Estimating jobs, and associated skills development needs, for current and planned investments in renewable energy has begun in Namibia as part of the green industrialization initiative. Additional analysis is required to understand the potential of the existing labor market and training providers to meet the skill requirements of these jobs, and the GRN is requesting for support for this.

Local production of cookstoves could also create local employment and economic benefits (conditional on promoting cookstoves that can be produced domestically, depending on local capacity, access to supplies, and production facilities).

Opportunities for communities through local content requirements on IPPs. Currently, all IPP generation licenses in Namibia require a minimum 30% previously disadvantaged Namibian (PDN) shareholding in the project company. PDN includes racially disadvantaged persons, women, and persons with a disability. However, this focus on PDN shareholding in project companies may not be sufficient to achieve the goal of maximizing socioeconomic benefits from renewable energy projects, since it may only benefit the elite given there is only a small group of PCN investors (same goes for EPC contracting). Other options for local content requirements could be pursued to ensure socio-economic benefits for communities at large, and some are mentioned in the actions below.

Other socio-economic benefits arising from the Compact: In addition to economic benefits, renewable energy projects contribute to environmental and health improvements. By reducing reliance on fossil fuels, these projects help decrease air pollution, leading to better health outcomes for local communities. The adoption of clean cookstoves reduces indoor air pollution, thus leading to improved health of household members. It also results in savings and reduces the time spent cooking or gathering fuel, which improves individual wellbeing, particularly for women and children, granting more time to spend either on other activities.

Challenges

Additional investments in the energy sector require workers to be ready to take on the emerging jobs. While there is a surplus of labor in Namibia, it is not clear if they have the necessary skills to take on new jobs and tasks that are expected to emerge. Even in the current labor market, employers experience significant skills gaps and mismatches. The productivity levels of individuals in Namibia as per the Human Capital Index (HCI) is low at 0.45 in 2020, meaning a child born in Namibia today will be 45 percent as productive when she grows up as she could be if she enjoyed complete education and full health. This is a better outcome than the average for Sub-Saharan Africa region (0.40) but lower than the average for upper middle-income countries at 0.56.

Future skills shortages may become particularly prevalent in the area of science, technology, engineering and mathematics (STEM) skills, considering that investments in solar, wind, hydro, and biomass energy as well as clean stoves require workers with these skills at all levels (from artisans to engineers), with especially large numbers required during the phase of infrastructure development. The need for workers with sound STEM skills is particularly important to consider, because they are also in high demand in other sectors, both in-country and abroad, and demand will increase further if investments in Namibia's oil and gas sector take off.

The higher education system is not producing enough STEM graduates in Namibia- in the past 5 years (2019-2023) the number of graduates in the field of Manufacturing, Engineering and Technology has been below 300 a year. In Technical and Vocational Education and Training (TVET), there are too few 'technician' level graduates (level 4 and 5 on the qualifications framework) and there are also concerns- with a few exceptions- with the quality of TVET programs offered and their responsiveness to the needs of industry. There are over 100 TVET providers in the country, but only few (e.g. Namibia Institute of Mining and Technology (NMIT) and Windhoek Vocational Training Center (WVTC)) are considered capable to provide the necessary skills for STEM related training for technicians, crafts persons and artisans.

For workers to be ready to take on new jobs, they do not just need to have the right skills, but they also need to be willing and able to move to where the jobs are. This will require particular attention in the energy sector, as many of the jobs in this sector are expected to be created in

[27] $1m invested in wind in Iowa produces 2.5 jobs- years (Weisbrod et al, 1995) $1m invested in wind or PV produces 5.7 jobs-year.

locations that are remote or at least outside large urban agglomerations.

Actions explored (approach)

To maximize opportunities for Namibians to access these job opportunities as a result of increased energy investments, there are several important actions to implement moving forward:

- **Estimating and mapping skill needs for the increased energy investments:** analysis of demand side (type and numbers of jobs, by skill level) and supply side (what relevant programs/courses are available, quality of the programs, graduates per year; skills of those in the labor market), to identify gaps in skill needs. Based on this, **prepare a Skills Development Strategy and Plan for the Energy Sector in Namibia** in consultation with public and private sector stakeholders. This process would be led by the MIME in collaboration with the Namibia Investment Promotion and Development Board (NIPDB), NamPower, the Ministry of Education, Private Investors and others.
- Implement actions from the Skills Development Strategy and Plan to **upgrade quality and quantity of STEM related training in TVET** (focused on levels 4 and 5 technician training), as well as **significantly increasing the numbers of university graduates focused on engineering related** courses of relevance for energy generation and distribution. These training courses should be vetted by representatives from the energy industry and partnerships forged to ensure students get practical, on-the-job training throughout their course. If needed, universities and TVET institutions can partner with an internationally renowned institute on developing and delivering courses for the first few years (through a twinning arrangement). This builds confidence amongst industry and students in terms of the quality and relevance of the training provided. For highly specialized jobs required in few numbers, , the govt could consider sending Namibians to other countries to receive the relevant training.
- **Strengthen Employment Services particularly in areas where investments are being targeted:** Improve and expand existing systems (led by the Ministry of Labor) for registering, supporting, training (re-skilling and upskilling), and matching job seekers, focusing on the installation and maintenance of off-grid solar systems and clean cooking solutions. This scheme could place specific focus on women and youth who are currently under-represented in energy specific jobs.
- **Support Innovation and Startups:** Promote entrepreneurship and innovation in the energy sector by providing funding, mentorship, and incubation support to startups working on innovative energy solutions. **Facilitate access to microfinance** and low-interest loans for small businesses and entrepreneurs in the renewable energy sector, enabling expansion and job creation.
- **Review local content requirements prepared by investors** with particular focus on how they plan to support surrounding communities. These plans could be reviewed to ensure alignment with the Skills Development Strategy and Plan as well as local economic development plans of the region, with specific focus on uplifting marginalized groups. For example, there could be requirements related to the local provision of certain components and/or services; or requirements related to training and education (expressed, for example, as a share of gross wages), to ensure effective skill transfers from international players to the Namibian workforce, particularly in the area of operation and maintenance of renewable energy plants; or incentives related to local government and/or community shareholding in the project company or to the allocation of a share of the project's after tax profits to the community to address its development needs (health, water and electricity provision, etc).

ANNEX VI
WOMEN'S INCLUSION

Namibia has made notable progress in women's inclusion as reflected in its high rankings in global and regional indices. Namibia is recognized as one of the countries in Africa that has made strides in women's inclusion according to the Africa Gender Index (AGI, 2023); further, the country ranked 8th out of 146 countries in the 2024 Global Gender Gap Index, as having closed at least 80% of its gender gaps. Namibia prioritized the inclusion of women in the 1998 Namibia Affirmative Action Act which encourages equal opportunities with respect to recruitment, selection, appointment, training, promotion and equitable enumeration in all sectors. Currently, 49 percent of households in Namibia are headed by women, however only 46 percent of all households have access to electricity Despite higher levels of educational attainment among Namibian women and progressive national policies to promote women in the workplace, the female labor force participation rate remains relatively low at 55.42 percent compared 62.7 percent for males.

Gender gaps in the energy sector are more apparent including in renewable energy sector where women remain largely underrepresented, replicating global trends. According to the 2024 Global Gender Gap Index, 42.5 percent of STEM graduates in Namibia were women compared to 57.5 percent men. Further, women make 34 percent of graduates in Engineering, Manufacturing and Construction courses compared to 66 percent of men. A 2019 study on school-to-work transition in Namibia STEM education revealed that underlying constraints to low enrollment of women in STEM fields include lack of exposure to technology, gender bias, and lack of time to invest in STEM subjects due to cultural and social norms that disproportionately designate household chores to girls. Further, educational institutions that offer STEM curriculums lack resources to create conducive environments for women to study STEM courses including unconscious bias, as well as lack of scholarships and internship opportunities which could prepare students for employment in the energy sector. Women are also underrepresented as employees, managers and leaders in the energy sector. For instance, in 2019 NamPower reported that 23 percent of its workforce and 30 percent of its management were women.

The GRN has included in its energy policy and legislation to increase the participation of women in the energy sector by creating opportunities to empower women to enter the energy sector and creating a more inclusive workforce in the energy sector. Further, the national gender policy includes legislation to increase women studying STEM fields. However, Namibia currently does not have a national women's inclusion strategy for the energy sector, which is needed to operationalize the existing policies and to create an enabling environment for women to fully participate at all levels in Namibia's energy sector and operationalize the policies such as a national gender action plan or strategy for the energy sector. Therefore, compact includes the development and operationalization of the national women's inclusion gender and energy strategy with the goal of increasing women's participation in the energy sector by 30 percent.

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