



NAMIBIA
UNIVERSITY
OF SCIENCE AND
TECHNOLOGY



Ministry of Industries,
Mines and Energy

"Towards a Bankable and implementation Plan of the Solar Thermal Technology Roadmap of Namibia"

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15-16 April 2026

ISEC

4th INTERNATIONAL
SUSTAINABLE ENERGY
CONFERENCE 2026

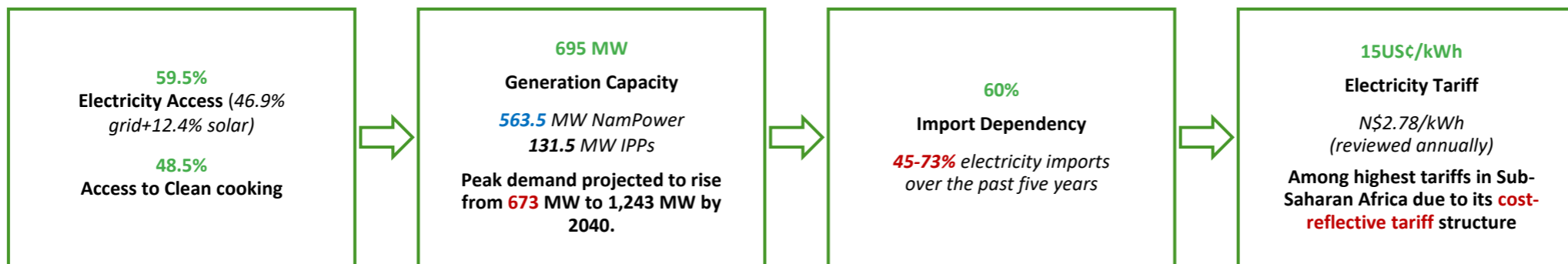
14 – 16 April 2026
Messecongress Graz, Austria

CONTRIBUTORS:

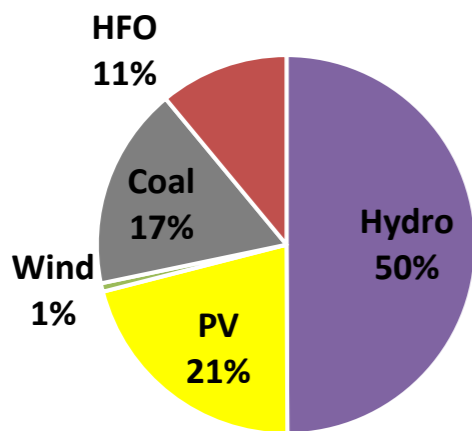
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**Namibia Energy Institute, NUST – Namibia*

Country Context

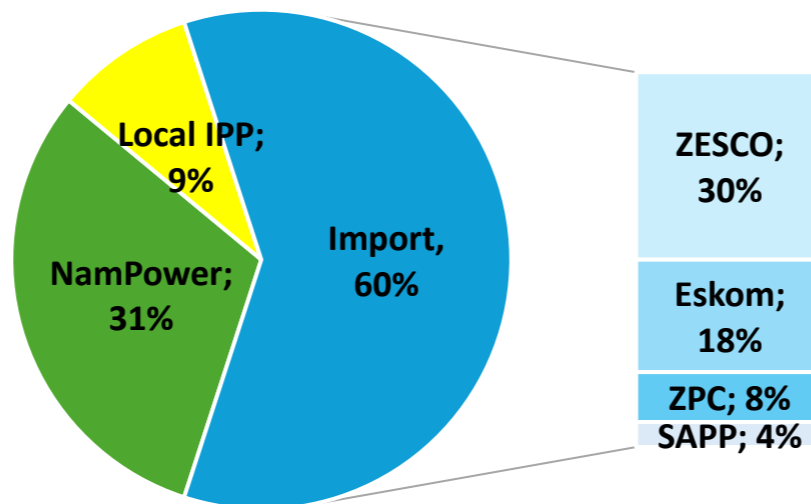


Generation Capacity



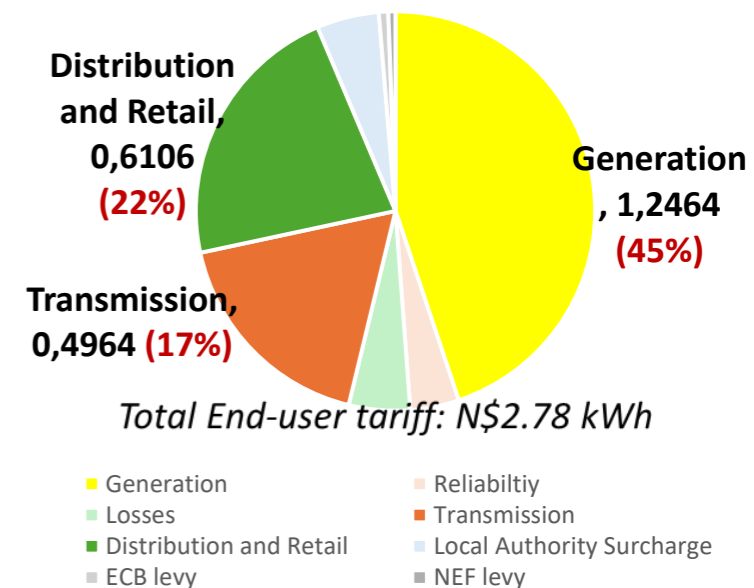
Source: 2024 NamPower Integrated Annual Report

Energy Mix



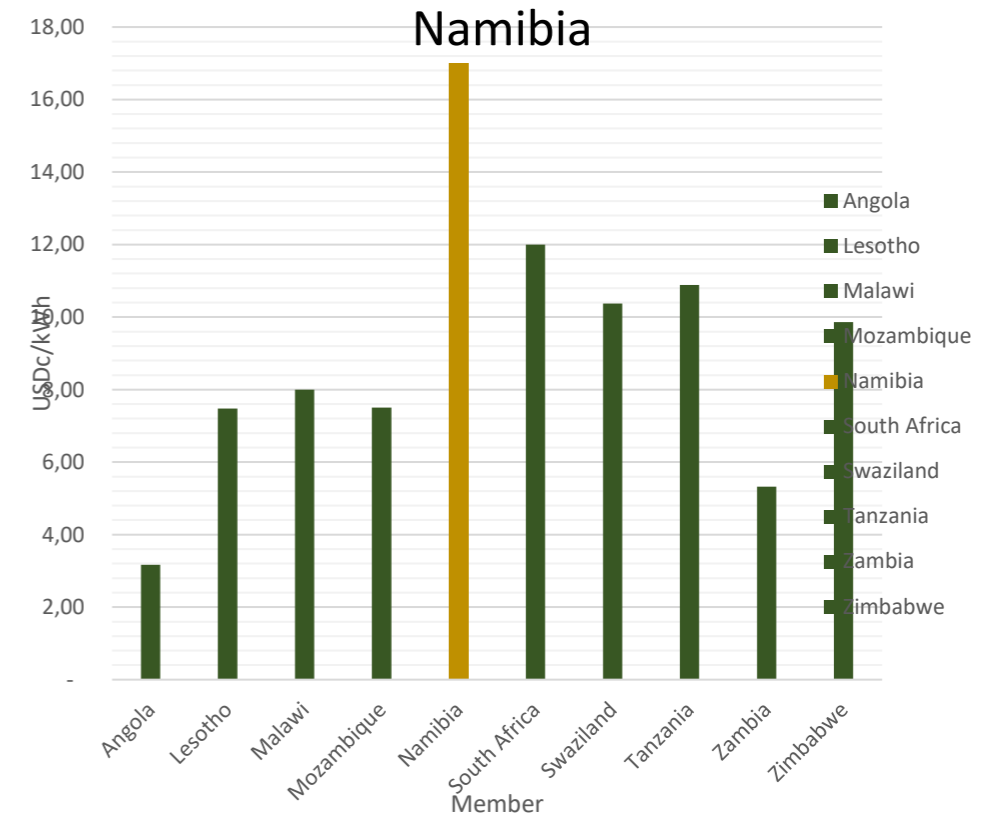
Source: 2024 ECB annual report

Total End-User Tariff Components



Development Challenge

- **Population: 3,022,401** (2023 Census).
- **Youth population: ~1.02 million (ages 15–34) = 34.1% of total; 71.1% are under 35.**
- **Unemployment: 36.9% overall; 44.4% among youth (15–34)**
- **Emerging Sectors** (Energy - Oil & gas, Biomass, Renewables, GH), Agriculture, CRM & SRM.
- Most analyses flag **mismatch and rising graduate unemployment.**
- **Increasing Industry demand for skilled workforce.**
- **Energy generation lower than demand** : Peak demand: >600 MW



- According to World Bank of 2024 -11% of monthly spending is allocated to prepaid of electricity.
- Namibian households spend 10% percent or more on total energy costs or 5–6% on electricity alone; lower spending is deemed affordable

The Bankable Solar Thermal RoadMap and Implementation plan is expected to provide solutions to these national challenges.

An initiative of SOLTRAIN

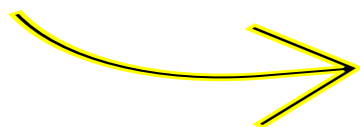
Bankable and implementation Plan of the Solar Thermal Technology Roadmap of Namibia funded by African Development Bank study completed in 2025



Strategy
Energy sector provides opportunity for integration to deliver impact.
Systemic Results: energy independence, cross sectoral development.
Strong Foundation for Industrialization –value chains, value addition. (NDP6)



Partnership of Government and
Financial Institution



Bankable study Objectives

To conduct a

Comprehensive assessment of current market and policy environment for SWHs.

Quantify Benefits

Economic and environmental analysis across residential, commercial, industrial, and rural segments.

Identify Financing

Develop affordable, inclusive financing mechanisms for mass adoption.

International Success Stories

1. Tunisia's PROSOL

Concessional lending and subsidies transformed solar thermal markets through targeted financing.

2. Hawaii's GEM\$

Utility-based on-bill repayment schemes drove mass adoption of solar water heating technologies.

Research Methodology

Market & Policy Review

PESTEL analysis, consumer surveys, international benchmarking

Cost-Benefit Analysis

Financial modeling across four segments and financing models

Financial Analysis

Alternative mechanisms: on-bill, leasing, carbon finance, ESCO

Implementation Plan

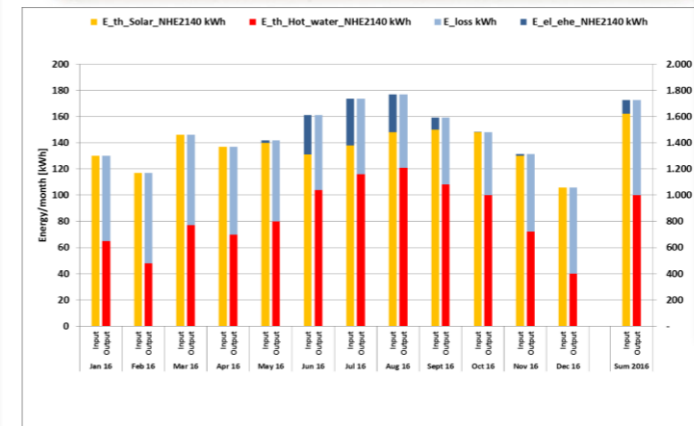
Phased interventions, stakeholder mapping, risk assessment

These two models demonstrate how financial innovation, regulatory support, and consumer confidence can scale renewable heating solutions.

With the support of SOLTRAIN Project, functional systems with evidence data monitoring

Namibia's SWH Market Dynamics

- **2017**
- National Renewable Energy Policy mandates SWH for government buildings
- **2022**
- 62,669 m² collector area operational; 7,561 systems installed
- **2023**
- 3,306 units imported (18.5% increase from 2022)
- **2030 Target**
- 1.5 million m² collector area (0.5 m² per inhabitant)



Despite excellent solar irradiation of 2,200-2,400 kWh/m² annually and over 300 days of sunshine, and the involvement of SOLTRAIN, SWH penetration remains below 2%.

Transformative Impact

SWHs offer cost-effective, climate-aligned solutions that reduce imported power reliance, lower energy costs, cut emissions, and create local jobs.

Implementation Roadmap

1. Policy Enforcement

Building codes, public housing programs, regulatory frameworks

2. Capacity Building

Technician training, consumer awareness campaigns

3. Financing Expansion

Expanded subsidy pools, innovative financing tools

4. Scale Deployment

1.5 million m² collector area by 2030

Four Financing Models Analysed

1. Housing Loan

20 years at 10% interest. Monthly: NAD 151. Total repayment: NAD 36,180. High interest costs but low monthly stress.

2. Solar Revolving Fund

5 years at 5% interest. Deposit: 30% (NAD 4,686). Monthly: NAD 206. Total: NAD 12,381. Most cost-effective but deposit barrier.

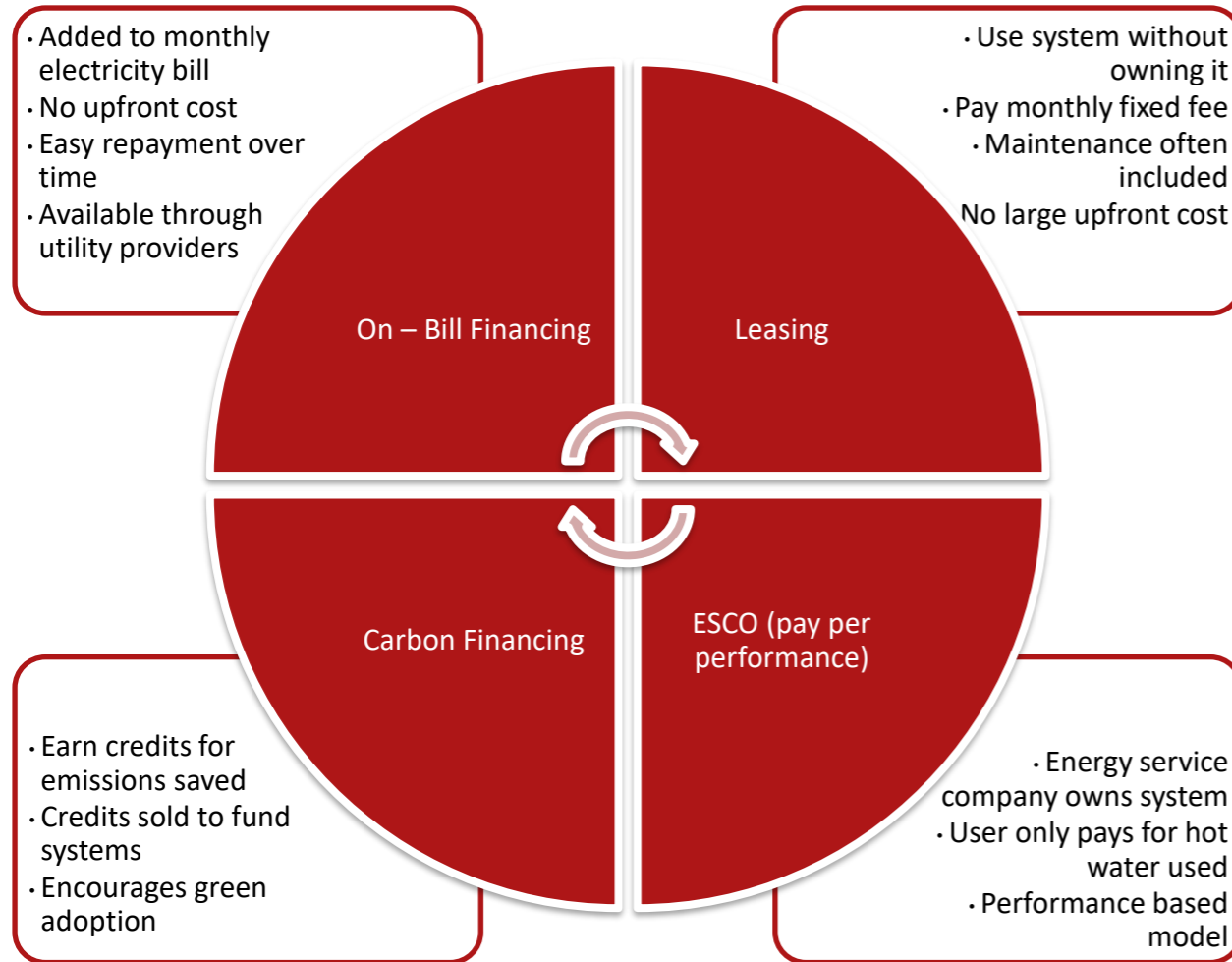
3. On-Bill Financing

9 years at 5% interest. No deposit. Monthly: NAD 180–200. Total: ~NAD 19,400. Balanced, scalable, inclusive option.

4. Buy-Back Scheme

20 years at 10% interest. 10% discount applied. Monthly: NAD 136. Total: NAD 32,737. Promotes waste management.

Four Financing Models Analysed



| Financing Mechanism | Residential Sector | Commercial Sector | Industrial Sector |
|----------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Traditional Loans | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Loan under SRF | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| On - Bill Financing | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Leasing | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Carbon financing | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| ESCO - Pay per performance | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

NEI is working with ERONGO RED to optimize electrical geyser using ripple control

Four Key Financing Mechanisms

- **On-Bill Financing**
 - Repayments through utility bills. Proven in Tunisia (PROSOL) and Hawaii (GEM\$). Inclusive but faces implementation hurdles with prepaid meters.
- **Leasing**
 - Reduced upfront costs with asset access. Underutilized in Namibia but shows strong potential with clear risk-sharing structures.
- **Carbon Financing**
 - Leverages international carbon markets (ITMOs). Offers long-term viability but requires verification systems and credit mechanisms.
- **ESCO Model**
 - Performance-based contracting. Reduces user risk. Successfully implemented in South Africa with pay-per-performance structures.

Path to 2030

- **19,000 Systems**
- Urban household deployment by 2031
- **Reduced Imports**
- Lower electricity imports and peak demand
- **Local Jobs**
- Installation and maintenance value chains
- *"Solar water heating represents a financially viable, socially inclusive, and environmentally sustainable pathway for Namibia's energy future."*

Strategic Recommendations

- **Policy Enforcement**
- Establish timelines for 30,000 SWH NDC target and link compliance to building approvals
- **Local Manufacturing**
- Provide tax breaks for local component production, following Tunisia's PROSOL model
- **Financial Access**
- Introduce tiered subsidies (30% for low-income) and partner with insurers to reduce lender risk
- **Awareness Campaigns**
- Replicate PROSOL's educational outreach using radio, workshops, and demonstrations
- **Quality Infrastructure**
- Enforce Solar Keymark certification and expand SOLTRAIN training to rural areas
- **Microfinancing**
- Develop pay-as-you-save/ESCO models with monthly repayments equal to electricity savings

Implementation Roadmap

1. Policy Enforcement

Building codes, public housing programs, regulatory frameworks with Green Council of Namibia – and the results of Task 69

2. Capacity Building

Technician training, consumer awareness campaigns – Centre of Excellence

3. Financing Expansion

Expanded subsidy pools, innovative financing tools

4. Scale Deployment

1.5 million m² collector area by 2030

Project Partners



Austrian
Development
Cooperation



For success of this programme:

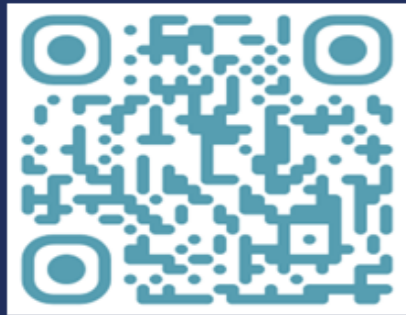
- A regional approach is recommended
- SOLTRAIN still required for the acceptance of the frameworks and standards.



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I thank you!



Namibia Energy Institute (NEI)



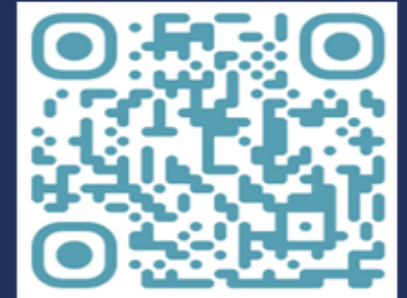
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