Solar Energy and Storage Market Profitability Analysis for Nigeria

# Executive Summary

This report provides an analysis of the costs and market potential for solar energy and storage in Nigeria. We will review the installation costs, total addressable market (TAM), serviceable available market (SAM), serviceable obtainable market (SOM), and a profitability analysis for solar home installations. The analysis assumes average installation costs and typical household demand for solar energy and battery storage, along with an estimation of the number of homes needed and the timeline to reach profitability.

# 1. Installation Cost for One Home

A typical solar system installation for a Nigerian household can vary depending on the household's energy needs. The size of the solar system ranges between 1-5 kW, with or without battery storage.

For a small household (1-2 kW system), the estimated installation cost is:

* • Solar panels: N200,000 – N500,000
* • Inverter: N100,000 – N200,000
* • Battery storage: N200,000 – N500,000 (for backup power)
* • Installation & wiring: N50,000 – N100,000

Total Installation Cost per Home: Approximately N1 million (or $1,316 USD).

For a larger system (3-5 kW), suitable for homes with greater energy demand, the installation costs range from N1 million to N2.5 million.

# 2. TAM, SAM, and SOM for Solar and Storage in Nigeria

## Total Addressable Market (TAM)

The TAM represents the entire potential market for solar energy and storage in Nigeria, assuming 100% adoption by all potential customers. Nigeria has a population of over 220 million people, and about 80 million Nigerians live off-grid or experience unreliable electricity supply, making them prime candidates for solar energy.

Assuming that solar energy could meet the country’s total energy demand, and using an average cost of N50 per kWh of solar power:

TAM for Solar Energy: 100 TWh of potential annual energy demand could lead to a TAM of approximately N5 trillion (or $6.5 billion USD).

For energy storage, the TAM would be based on the potential demand for backup power systems:

TAM for Solar Storage: Assuming 5 GW of storage capacity needed, the TAM for storage could reach N250 billion (or $325 million USD).

Thus, the combined TAM for solar energy and storage in Nigeria could be around N5.25 trillion (~$6.8 billion USD).

## Serviceable Available Market (SAM)

The SAM narrows down the TAM to focus on customers who are more likely to afford solar solutions. This includes households with purchasing power in both off-grid and underserved regions.

Assuming 10 million households with the potential for solar adoption, and using an average system cost of N1 million per installation, the SAM for solar energy alone could be:

SAM for Solar: N10 trillion (or ~$13 billion USD).

For storage solutions, targeting 20% of these households (2 million homes) would yield:

SAM for Solar Storage: N1 trillion (or ~$1.3 billion USD).

Thus, the combined SAM for solar and storage is estimated at N11 trillion (~$14.3 billion USD).

## Serviceable Obtainable Market (SOM)

The SOM represents the portion of the SAM that can be realistically captured by a company or set of companies. Assuming a 5-10% market capture, the SOM for solar would be:

SOM for Solar: N500 billion (~$650 million USD).

For storage:

SOM for Solar Storage: N50 billion (~$65 million USD).

The combined SOM for solar energy and storage would be approximately N550 billion (~$715 million USD).

# 3. Profitability Analysis

## Revenue and Costs Per Installation

Using an average installation cost of N1 million per home and assuming that each household pays N1.5 million over a 5-year period (including maintenance and service fees), the estimated profit per home is:

* • Revenue per home: N1.5 million (~$1,974 USD).
* • Cost per home: N1 million (~$1,316 USD).
* • Profit per home: N500,000 (~$658 USD).

## Break-even Point and Profitability

To reach profitability, a company must cover its initial investment and operational costs. For this analysis, we assume an upfront investment of N200 million (~$263,158 USD) for infrastructure, equipment, and marketing, and N200,000 (~$263 USD) in overhead per installation.

The following table provides an estimate of revenue and profit based on the number of homes installed:

Year 1: 100 homes installed, Revenue: $197,400, Profit: $65,800  
Year 2: 250 homes installed, Revenue: $493,500, Profit: $164,500  
Year 3: 500 homes installed, Revenue: $987,000, Profit: $329,000  
Year 4: 1,000 homes installed, Revenue: $1,974,000, Profit: $658,000  
Year 5: 2,000 homes installed, Revenue: $3,948,000, Profit: $1,316,000

By Year 2, the company can break even, and by Year 3, it can expect to become profitable with a net positive of $296,142.

Break-even Point: Number of homes to reach profitability: 350-400 homes.  
Expected timeline to profitability: 2 to 3 years.

# Conclusion

The solar energy and storage market in Nigeria presents significant opportunities, especially in off-grid and underserved areas. With an installation cost of around $1,316 per home and a potential market size of $14.3 billion USD, the solar sector is ripe for investment. A well-executed plan could achieve profitability within 2 to 3 years, with a break-even point of approximately 350-400 installations. The increasing demand for reliable power solutions, coupled with declining solar costs and government incentives, makes solar energy a viable and profitable venture in Nigeria.