Business Plan

ImoleDe: Smart Solar Energy Device and Management System

Smart Systems Research Group

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Executive Summary

With a GDP of approximately $448 billion, Nigeria is the largest economy in sub-Saharan Africa, estimated at over 220 million people. With only about 60% electrification, Nigeria falls behind comparable sub-Saharan countries like Ghana (83%) and Kenya (64%) in electrification rate. The Government of Nigeria, over the years, has invested billions of dollars in improving the electricity supply and privatizing the sector to assist it in reaching more efficiency. Unfortunately, progress has been slow. About 8.8 million Nigerians currently have no access to electricity and only 66% of those who have electricity have an average of 5 hours per day. Nigeria provides presently 0.04% of the required 4000kWh annual per capita electricity consumption per person needed to reach energy self-sufficiency and sustainability. This has dramatically affected the country's economic development. Renewable energy systems offer new possibilities for areas with low or unreliable electricity access. An added advantage is that Nigeria receives an estimated 3.5 7.0 kWh/m2/day of solar installation for optimal photovoltaic (PV) electrification and has one of the shortest project lead times in power generation projects. From literature, 10.5 million Nigerians have inverter-based energy system. This market is one of the fastest growing markets in Nigeria with a growth rate of 38% in 2022, 628,000 additional sales. Unfortunately, even with the influx of this alternative energy supply, electricity is not available because generation and storage is not adequately monitored and managed. There are limited ways for users to monitor, control, manage, and optimize the usage of energy generation and storage. The ImoleDe Smart Solar Energy Device and Management System is designed to optimize solar inverter system performance and extend system longevity through intelligent energy management techniques. This innovative product combines real-time remote monitoring, intelligent load prioritization, and smart control using sensors, a mobile application, and AI algorithms, with the goal of enhancing the user experience and ensuring reliable power management in solar installations. 480.5 million Naira (Four Hundred and Eighty Million, Five Hundred Thousand Naira is needed to transform our product ImoleDe from prototype to full-scale production and get-to-the market ready products. It will also be used to kick-off the company and run it for 3 years. It's the comprehensive costs associated with running a company, including fixed, variable, direct, and indirect costs for three (3) years.

Company Overview

ImoleDe is a smart energy management system for household and businesses that monitors, controls and optimizes energy usage using sensors, embedded systems and IoT, mobile application and AI for real time load prioritization, enhanced efficiency and sustainable system. The system prioritizes load usage, allowing essential tasks like running the washing machine or pumping water to occur during peak sunlight hours—even when users are away. By tracking energy generation and consumption in real time, ImoleDe empowers users to make smart energy decisions, maximizing the value of their solar investment. Imagine the impact:firstly, peace of mind and convenience, non-reliance on Grid supply. Electricity when you need it for the purpose needed. Secondly, more focus on the customer's job in the afternoon, knowing that he/she will come back to electricity, to cook, the children to do their assignments, the family to embark on online assignments and the family to relax in a comfortable environment. Enough energy to also use for early morning preparations. Furthermore, battery longevity and timely alerts to prepare to buy new batteries. Business can work for longer hours knowing that they will meet specified deadlines and targets.

Problem Statement

Nigeria, with a GDP of $448 billion and a population of over 220 million, has an electrification rate of only 60%, far behind Ghana (83%) and Kenya (64%). Despite billions of dollars invested in the power sector, progress is slow: about 8.8 million Nigerians remain without access to electricity, and 66% of those connected receive just 5 hours of power daily. Per capita supply is only 0.04% of the required 4000 kWh annually, severely limiting economic growth.

While the inverter market is expanding rapidly with 10.5 million users and 38% growth in 2022 (adding 628,000 sales), energy generation and storage remain poorly managed. Existing solutions like timers and remote monitoring tools are limited, error-prone, and lack real-time adaptability. This results in sub-optimal use of solar investments, shortened battery life, and wasted resources, highlighting the urgent need for a smart, automated, and reliable inverter management solution.

Our Solution

Our solution ImoleDe is a non-intuitive smart energy management system to help home owners and businesses monitor, control, and optimize their energy usage with the help of

sensors, mobile app and artificial intelligence for real-time load prioritization from anywhere in the world. It promises smart analysis, control with AI and a good return on investment. Table 1 presents our solution and challenges addressed.

Table 1: Challenges and Solutions For ImoleDe

Challenges Addressed by our Solution	Our Solution
Unavailability of electricity when needed	Electricity is available when needed
Battery Storage is not available when needed	Battery storage is controlled automatically to ensure availability at specified time
Lack of feedback and information about inverter installation	Monitoring, control, and management of the inverter system is available to the user
Professional installation	Self Installation
Unpredictable failure due to reduction in the storage capacity of the batteries	Prior knowledge to enable proper budgeting
Manual control and management	Automated prioritization of load
Lack of information and professional know-how	Artificial intelligence control and management to ensure optimal use of the installation

Product and Service Offerings

The ImoleDe Smart Solar Inverter Management System is an intelligent add-on device designed to integrate seamlessly with existing solar inverter installations. It enhances energy utilization by providing real-time monitoring, intelligent load prioritization, remote control, and AI-driven optimization. The system consists of a hardware device installed near the inverter and a mobile application available on both Android and iOS platforms. Together, they extend the lifespan of inverter systems, improve user satisfaction, and maximize returns on renewable energy investments.

Key Product Features

a. Real–Time Monitoring

a) Status of grid, inverter, solar panels, and battery (charging/discharging).
b) Live consumption and production data displayed on the mobile app.
c) Detailed analytics and usage insights for informed decision-making.

b. Load Prioritization & Control

a) Ability to manually or automatically shut down non-essential loads to conserve battery life.
b) Smart breakers for reliable switching and safety.
c) Integration of user-defined priorities for appliances (e.g., refrigerator, security lights, CCTV, washing machine, Wi-Fi).

c. AI–Enabled Optimization

a) The system learns user behavior over time to automate load prioritization.
b) Predictive control based on weather conditions, solar irradiation, and battery capacity.

d. Robust Connectivity Options

a) Bluetooth Low Energy (BLE) and Wi-Fi for local control.
b) Internet connectivity (via modem or RJ45 Ethernet port) for remote access.
c) Cloud-based server for secure data storage, synchronization, and AI processing.

e. Safety and Reliability

a) Electrical isolation between grid, inverter, and solar panels for thunder strike protection.
b) High-quality casing with IP65 rating for dust and water resistance.
c) System lifespan: 15–20 years with minimal maintenance.

f. Scalability and Compatibility

a) Works with inverter systems from 12V up to 96V.
b) Compatible with multiple inverter brands, batteries, and solar panels.
c) Modular expansion to accommodate additional smart switches and appliances.

Mobile Application Features

g. Onboarding and Setup

a) Simple registration and device linking.
b) Easy configuration of inverter size, solar panels, batteries, and appliances.

h. Monitoring Dashboard

a) Energy usage chart (hours, days, weeks).
b) Real-time load monitoring and device-level consumption.
c) Battery state-of-charge and inverter health status.

i. Control Features

a) Remote switching of appliances (ON/OFF).

b) Alerts and notifications for anomalies (low battery, overload, offline status).

c) Smart automation in Premium mode.

j. Feedback & Support

a) Built-in channels for feedback, reporting issues, and customer support.

b) Regular app updates and feature upgrades.

Target Market and Segmentation

Nigeria's renewable energy market presents a large and rapidly growing opportunity. Our target market comprises an estimated 10.5 million inverter users nationwide, representing a segment of the 218 million people in Nigeria, of whom 88 million experience unreliable access to 24-hour electricity. Within this group, ImoleDe is positioned to serve households and businesses that already own inverters, as well as those aspiring to adopt renewable solar energy systems. Importantly, our primary customers earn above ₦100,000 per month, are based in urban, suburban, and semi-rural locations, and demand reliable electricity to sustain modern living.

Customer Segments/Target Market

We will primarily target the following three market segments:

1. People with No Access to 24-Hour Electricity
   a. Represents over 88 million Nigerians.
   b. These users face erratic grid supply averaging less than 5 hours per day.
   c. They are highly motivated to invest in inverter and solar solutions to stabilize power access.
2. Potential Owners and Users of Inverters
   a. Households earning ₦100,000+ per month, with disposable income to invest in backup power systems.
   b. Survey results show that 98% of non-inverter owners hope to acquire one as soon as financially possible.
   c. This is a strong early adopter group for ImoleDe.
3. Renewable Solar Energy System Users
   a. An estimated 10.5 million Nigerians already own inverter-based systems, of which 79% have solar panels installed.

b. However, these users continue to struggle with inefficient energy management, unpredictable utility supply, and manual load control.
c. ImoleDe directly addresses these gaps through smart, automated, AI-driven optimization.

Early Adopters (Personas)

1. **Persona 1:** Bolanle Adisa (Public Servant) is a 35-year-old lecturer with a household income of ₦200,000/month. Married with children, she requires steady power for domestic appliances, lighting, laptops, Wi-Fi, and security systems. Her challenges include poor timing of electricity availability, no knowledge of backup capacity, and lack of battery health insights.

2. **Persona 2**: A 26-year-old single engineer whose name is Michael Baba Musa (Hardware Engineer) earns ₦400,000/month. He requires reliable power for refrigeration, microwave, air conditioning, and work equipment. His concerns mirror those of Persona 1, centered on unpredictability of supply, poor backup visibility, and fear of wasted investment.

3. **Persona 3**: Godfrey Chukwu (Software Engineer) is a 30-year-old single engineer who earns ₦600,000/month. He requires reliable power for his online jobs and deadlines. He needs to power his laptop, extra fast Graphical User Interface enabled desktop computer, lightning, refrigerator, and air conditioner. His concerns is centered on unpredictability of supply, and fear of meeting the tight deadlines of his clients.

Validation of Market Assumptions

Our survey (90% coverage in southwest Nigeria) confirms:

a. 50% of respondents already own inverters, with 79% relying on solar-based charging.
b. 98% of non-owners intend to acquire inverters, confirming strong latent demand.
c. 64% of users manually switch off non-essential loads to preserve energy, while 10% report losing power unexpectedly even after load adjustments.
d. 73% of respondents need at least 3 hours of night-time power, while 63% require 2–3 hours in the morning, this clearly highlights the unmet needs ImoleDe can solve.

Competition

Our solution is a smart solar system management solution that extends the lifespan of solar inverter systems. It uses smart technologies to help users reliably meet their energy needs by providing real-time information and load prioritization through manual or automated control.

Prior systems

i. are characterized by unpredictable failure due to reduction in the storage capacity of the batteries while the present system provides prior knowledge to enable proper budgeting
ii. have not solved the availability of electricity when needed, with this present invention electricity is available when needed, by analyzing system data, it control load, ensuring priority devices are connected, switching off non-essential loads.
iii. provide information about mains energy availability, charging and discharge rate, battery capacity; either low or full. The present invention provides a system of monitoring, control, and management of the solar energy system and all these are made available to the user

Innovation

a. Smart Load Prioritization: By analyzing system data, the System can shut down non-essential loads to conserve energy, ensuring that priority devices, such as security systems, routers, or freezers, remain powered for longer duration during outages.
b. Real-time Remote Monitoring, Control and Management: Continuously monitors system performance, detecting anomalies and alerting users to potential issues. Users can monitor, control and manage their solar systems remotely through a user-friendly mobile application. The app provides real-time data on inverter loading, grid availability, solar panel output, and battery health. For enhanced connectivity, the system utilizes cellular networks for internet access, allowing users to control and manage their solar energy system from anywhere.
c. Mobile Application: The mobile application supports customer secured data transmission, and real-time updates. Users can control loads remotely based on personal preferences, reducing energy consumption costs and improving battery life. The app is compatible with smartphones, providing accessibility to a broad user base.

Assertions

a. Load Management: The system manages energy distribution to prioritize loads as specified by users.
b. Efficiency: The system achieved an efficiency of 93% in converting DC power to AC.
c. Availability: The system is available for operation at least 99% of the time.
d. Reliability: The system demonstrates a mean time between failures (MTBF) of at least 10 years.
e. Data Encryption: The system encrypts all data transmitted between devices and the cloud.

f. Access Control: The system implements role-based access control to restrict unauthorized access.
g. Electrical Safety: The system complies with relevant electrical safety standards

Direct Competitors

1. Building (power) management system (WAREEIndia; HIMIN India, ELKAY-UK, Chacon)
2. Solar systems with timers (iBoom, Connevans, Energy Circle, TONGOU, PHYWE, GEYA)
3. Solar system with energy monitors USwitch, SenseEnergy, OWL, MAK, Emporia
4. Energy management applications Homewizard energy, Energy level tracker, Power on: Energy flow, MySun power

Indirect Competitors

1. Solar system manufacturers in Nigeria (Astrum Energy, Enugu; Greenage Tech, Enugu; Volsus Energy, Kwara)
2. Electricity Distribution companies (Benin Owena electricity company)
3. Generator manufacturers (Maikano,
4. Rechargeable devices, power banks manufacturers (QASA, KAMISAFE, DP energy)

Our Competitive Advantage

Energy storage is a basic part of the renewable solar energy system because, it defines backup time, availability and life-span of the system. Most users have no control over the management of the inverter system and, therefore, sub-optimal use of expensive installations and investment. Existing solutions addressing the problems of monitoring, control and management of existing inverter system with and without solar panels are the timers and remote monitoring for feedback and manual control.

Timers are add-on device for cutting off energy to individual load on the inverter installations and the drawbacks are: limited adaptability; lack of real-time data and control coupled with limited; and high potential for user error

Another solution is the remote monitoring of the energy storage and, with received information, the user manually switches off or on devices based on information: limited adaptability; Manual control; and high potential for user error

The difference in our value proposition compared to the competitors is presented in Table 2.

Table 1: Business environment and our value over our competitors

Features	Solutions			
	Building (Power) Management System	Systems with Timers	Systems with Energy Monitors	ImoleDe
Remote Control	√	×	×	√
Smart Control	√	×	√	√
Real-time feedback	√	×	√	√
Non-intrusive	√	√	√	√
Artificial Intelligence	√	×	×	√
Applicable to renewable energy solutions	√	√	√	√
Available in Nigeria	√	√	√	√
Popularity	×	×	×	×
Timed Control	√	√	√	√
Affordable	×	√	×	√
Monitor	√	×	√	√
Self-Installation	×	√	√	√
House load Prioritization	×	×	√	√

Service Plans

Pricing will be positioned mid-range, above basic timers/manual controllers but below high-cost international smart systems. Customers will feel they are receiving great value, as the system saves battery costs, reduces downtime, and optimizes electricity usage. ImoleDe's pricing model will be designed to ensure affordability and scalability for the Nigerian market while reflecting the value of smart energy management.

a. Standard Plan

Base hardware and mobile app features with manual load prioritization and monitoring. Positioned for cost-sensitive households and small and medium scale enterprises (SMEs who want essential control.

a) Includes all core features of the ImoleDe device and mobile app.
b) Users can manually prioritize and control loads via the app.
c) Provides detailed analytics and notifications.
d) Suitable for cost-conscious customers who want basic monitoring and manual control.

b. Premium Plan

Targeted at professionals, institutions, and businesses seeking convenience and long-term optimization.

a) Includes all Standard Plan features plus AI-enabled smart monitoring and control.
b) The system learns user behavior patterns over time and automatically prioritizes loads.
c) Eliminates the need for manual intervention, ensuring efficiency and convenience.
d) Best suited for professionals, businesses, and advanced users seeking automation.

C. Flexible Bundles

Partner with inverter/solar distributors to offer ImoleDe as an add-on package at point-of-sale.

Services Provided

a. Hardware Installation and Setup

a) Carried out by certified technicians using standard tools.
b) Includes connection to inverter, solar panels, grid, and distribution board.

b. Software and Mobile App Support

a) User-friendly app downloadable from app stores.
b) Automatic software and firmware updates for enhanced performance.

c. Customer Support & Maintenance

a) Online tutorials, video guides, and FAQs for self-help.
b) Remote technical support for troubleshooting.
c) Minimal hardware maintenance; occasional breaker reset or firmware updates.

Product Overview

The conditions for smooth operations

a. Cloud connectivity: secure and stable cloud connectivity for remote monitoring, updates and analytics.
b. Secure wireless Communication: reliable wireless communication protocols and Implementation of secure communication protocols to protect data transmission
c. Real-time monitoring: Real-time monitoring and analytics to track system performance
d. Smart monitoring and controls: monitoring and smart controls for adjusting consumption based on priority loads and state of the inverter system. Smart solid state relays that shut down parts of the load based on user priority, preferences and availability.

e. User-friendly interface: intuitive and user-friendly mobile phone interface
f. Sensors and monitoring systems: accurate sensors and monitoring systems to track performance and detect issues
g. Mobile application: remotely send information to the smart device to control and select connected devices in the building it is installed based on user preference and state of the inverter.

Limitation

Some limitations of a smart solar energy management system:

a. Interoperability Issues: Integration with existing infrastructure and devices may be challenging due to compatibility issues.
b. Cybersecurity Risks: Connected systems can be vulnerable to cyber threats, compromising system security and data privacy.
c. Sensor and Hardware Failures: Component failures can occur, affecting system performance and accuracy.

Marketing Plan

The ImoleDe brand will be built around the Company's unique value proposition:

i. Offering reliable, affordable, and intelligent solar inverter management.
ii. Providing real-time monitoring and control to ensure uninterrupted energy access.
iii. Delivering AI-driven efficiency that extends inverter and battery life.
iv. Empowering Nigerians to maximize their energy investment and improve quality of life.

Our brand positioning is to be recognized as the trusted solution for smart solar management in Nigeria and West Africa, enabling households, SMEs, and institutions to take control of their energy future.

Promotions Strategy

To reach our target customers, households, SMEs, and institutions with inverters or solar-based systems, as well as aspiring inverter owners. Our promotional strategy will include:

a. Direct Sales and Partnerships

a) Assign dedicated sales representatives to partner with solar distributors, installation firms, and inverter vendors to bundle ImoleDe with new installations.

b) Engage directly with estate developers, schools, hospitals, and SMEs that rely heavily on renewable power.

b. Public Relations (PR)

a) Leverage press releases, interviews, and local energy conferences to highlight ImoleDe's unique value proposition.

b) Work with regional newspapers, TV, and online tech platforms to showcase the solution's impact on Nigeria's energy crisis.

c. Advertising Campaigns

a) Run targeted digital ads on social media platforms (Facebook, Instagram, LinkedIn, X) highlighting the pain points of unreliable electricity and how ImoleDe solves them.

b) Partner with energy-focused blogs, YouTube influencers, and renewable energy forums to demonstrate ImoleDe in action.

d. Customer Education and Awareness

a) Launch a content marketing strategy via a dedicated website and blog featuring articles on energy optimization, inverter tips, and solar management.

b) Provide free webinars, demo sessions, and workshops for customers and technicians to build trust and awareness.

e. Pre–Launch and Launch Events

a) Organize pilot demonstrations and roadshows in key Nigerian cities (Lagos, Abuja, Akure, Port Harcourt) with prospective customers, industry stakeholders, and the media.

b) Collaborate with universities, energy hubs, and green-tech expos to create buzz around ImoleDe.

Timeline and Metrics

The Timelines outlines the schedule and phases of implementation. They show when key activities, deliverables, and milestones are expected to happen. Timelines help ensure the project stays on track and stakeholders know what to expect at each stage. The Metrics are the measurable indicators used to track ImoleDe's success and progress. These include outputs (e.g., number of users onboarded, retention rate, systems deployed), outcomes (e.g., adoption rate, engagement level, satisfaction score), and impact (e.g., cost savings, efficiency improvements, or learning outcomes). Metrics make it possible to evaluate whether ImoleDe

is meeting its goals. The timeline and metrics can be implemented with the budget attached to the submission. A summarized budget is presented in Table 4.

Table 3: The implementation timeline, outlining the milestones and descriptions

Year	Quarter	Milestone	Description
Year 1	Q1	TRL 6 Validation	Complete prototype testing in operational environment
Year 1	Q1	Design Refinement	Incorporate feedback and improve system reliability
Year 1	Q2	Certification Preparation	Initiate compliance and regulatory certification processes
Year 1	Q2	TRL 7 Achievement	Demonstrate system performance in relevant environment
Year 1	Q3	Certification Completion	Obtain necessary certifications for market entry
Year 1	Q3	TRL 8 Validation	Complete integration and demonstration in final form
Year 1	Q4	Market Entry	Launch product in target market with initial sales
Year 1	Q4	Customer Acquisition	Begin onboarding early adopters and partners
Year 1	Q4	TRL 9 Achievement	Proven system through successful mission operations
Year 2	Q1, Q2	Sales Growth	Expand sales channels and increase customer base
Year 2	Q3, Q4	Market Penetration	Strengthen brand presence and user adoption
Year 2	Q1-Q4	International Expansion	Explore new markets and strategic partnerships

Table 4: ImoleDe Budget Breakdown (₦480.5 Million / 3 Years)

Category	Allocation (%)	Amount (₦ Million)	Ccomment
Personnel / Human Capital	20%	₦96.10	Salaries, training, capacity building
Technology Development (TRL 6–9)	10%	₦48.05	Prototyping, software, firmware, AI integration
Operations / Infrastructure	10%	₦48.05	Office space, utilities, logistics
Go-to-Market Strategy	10%	₦48.05	Marketing, partnerships, distribution
Monitoring and Evaluation	Fixed (5%)	₦15.00	Impact tracking, reporting, audits
Tools and Equipment	20%	₦96.10	IoT hardware, testing tools,

Category	Allocation (%)	Amount (₦ Million)	Ccomment
			lab equipment
Contingency	Fixed (5%)	₦15.50	Risk buffer, unforeseen expenses
Development and Sales of 500 Devices	20%	₦96.10	Manufacturing, assembly, packaging
Total	**₦480.5 Million**		

This structure ensures balanced investment across technical development, human capital, market readiness, and risk management.

Key Performance Metrics

The key performance metrics to monitor during ImoleDe's 2-year journey from TRL 6 to TRL 9, including market penetration and sales are presented. These metrics are grouped by category and aligned with each phase of growth:

Technology Development Metrics (TRL 6 – 9)

a. Prototype Reliability Rate: % of successful test runs vs total tests
b. System Uptime: Operational hours without failure
c. Energy Optimization Accuracy: How well the AI predicts and manages solar energy usage
d. Integration Success Rate: % of successful hardware-software integrations
e. Certification Milestones Achieved: Number of regulatory approvals obtained

Market Entry and Penetration Metrics

a. Customer Acquisition Rate: New customers per month/quarter
b. Conversion Rate: % of leads that become paying users
c. Market Share: % of target market using ImoleDe
d. Geographic Expansion: Number of new regions entered
e. Customer Retention Rate: % of users who continue using the system after 6–12 months

Sales and Financial Metrics

a. Monthly Recurring Revenue (MRR): Revenue from subscriptions or services
b. Customer Lifetime Value (CLTV): Average revenue per customer over their lifetime
c. Customer Acquisition Cost (CAC): Cost to acquire one customer
d. Gross Margin: Revenue minus cost of goods sold
e. Break-even Point: When revenue equals total costs

Operational and Support Metrics

a. Installation Time: Average time to deploy the system
b. Support Ticket Resolution Time: Average time to resolve customer issues
c. System Downtime: Time the system is unavailable
d. User Satisfaction Score (CSAT): Based on feedback surveys
e. Net Promoter Score (NPS): Likelihood of users recommending ImoleDe

FINANCIAL FORECASTS

The pricing model is a strategic approach to determine the optimal price for their products or services. It helps the business balance our revenue goals with customer affordability and perceived value. By selecting the right pricing model, we hope the business can optimize her pricing strategy, increase revenue, and maintain a competitive edge in the market.

A financial projection framework is a structured approach used to estimate a company's future financial performance. This is a financial projection, starting from the year after the roll out of the first 500 devices, when the system has entered the market and penetration is increasing monthly and yearly. It provides a clear and organized methodology for forecasting revenue, expenses, profits, and cash flows. By using a financial projection framework, The system can create accurate and reliable financial forecasts, enabling informed decision-making and strategic planning. Figure 5 presents the pricing model, and Table 6 presents the 3-year financial projection.

Table 5: Pricing Model

Plan	Target Users	Assumed Monthly Price (₦)	Revenue Potential
Basic Home Kit (1–5 devices)	Small households	150,000	Entry-level adoption
Standard Home Kit (6–10 devices)	Medium households	250,000	Strong middle tier
Deluxe Home Kit (11–20 devices)	Large homes and SMEs	500,000	High-value recurring
Utility-Scale (50+ devices)	Estates, schools, hospitals, industries	2,500,000	Enterprise and licensing revenue

Table 6: Financial Projection Framework

Year	Focus	Revenue Trend	Cost Trend	Outcome
Year 1	Build and Deploy	Moderate (Household kits)	High (Research and Development, manufacturing, marketing)	Establish brand presence
Year 2	Scale Adoption	Strong (Standard and Deluxe uptake)	Stabilizing (optimized production and distribution)	Market share growth
Year 3	Expansion	High (Utility-Scale contracts)	Relatively lower than revenue	Profitability and regional expansion

Monthly Revenue Projection

The monthly revenue projection is created by analyzing historical data to identify trends and patterns, and determine the business model and to understand revenue streams. Tables 7 - 9 presents the monthly revenue projection.

Table 7a: Annual Revenue Year 1

Plan	Adoption (Users)	Price (₦)	Monthly Revenue (₦)
Basic Home Kit	200	150,000	30,000,000
Standard Kit	100	250,000	25,000,000
Deluxe Kit	50	500,000	25,000,000
Utility	5	2,500,000	12,500,000
Total			92,500,000

Annual Revenue Year 1 = ₦1.11B

Table 7b: Annual Revenue Year 2

Plan	Adoption (Users)	Price (₦)	Monthly Revenue (₦)
Basic Home Kit	400	150,000	60,000,000
Standard Kit	200	250,000	50,000,000
Deluxe Kit	100	500,000	50,000,000
Utility	10	2,500,000	25,000,000
Total			185,000,000

Annual Revenue Year 2 = ₦2.22B

Table 7c. Annual Revenue Year 3

Plan	Adoption (Users)	Price (₦)	Monthly Revenue (₦)
Basic Home Kit	600	150,000	90,000,000
Standard Kit	300	250,000	75,000,000
Deluxe Kit	150	500,000	75,000,000
Utility	20	2,500,000	50,000,000
Total			290,000,000

Annual Revenue Year 3 = ₦3.48B

A cost structure refers to the various expenses a business incurs to operate and produce its goods or services. It's a comprehensive breakdown of all the costs associated with running a company, including fixed, variable, direct, and indirect costs. By analyzing and understanding ImoleDe's cost structure, we can optimize their expenses, improve profitability, and make informed strategic decisions. This is presented in Table 8. Components of a cost structure includes

a. Fixed Costs: Expenses that remain constant regardless of production levels, such as: rent, salaries, insurance, depreciation
b. Variable Costs: Expenses that fluctuate with production volume, including: raw materials, utilities, direct labor, manufacturing supplies
c. Direct Costs: Expenses directly attributed to producing specific goods or services, such as: raw materials, direct labor, manufacturing supplies
d. Indirect Costs: Expenses necessary for overall operations but not directly attributed to specific products or services, including: utilities, rent, administrative salaries, and depreciation

Table 8: Cost Structure

	Category	Amount (₦)	Notes
S/N	Fixed Costs		
1	Manufacturing and Research and Development	250,000,000	Annual
2	Hosting (cloud, monitoring)	15,000,000	Annual
3	Infrastructure and Logistics	50,000,000	Annual

	Category	Amount (₦)	Notes
4	Software Dev. and Maintenance	50,000,000	Annual
5	Operations/HR (20% of subtotal)	73,000,000	20% × 365M
	Total Fixed Costs	438,000,000	≈ ₦36.5M/month
	Variable Costs		
1	Marketing and Sales	10,000,000	Annual
2	Customer Support and Maintenance	15,000,000	Annual
3	Transaction Fees	3% of revenue	Variable
	Baseline Variable Costs	25,000,000 + 3% of revenue	Annual

Table 9 presents the types and quantities of products or services sold monthly. For ImoleDe, this could include: number of smart energy units sold, subscription plans (basic, premium), installation services, maintenance packages, etc

Table 9: Sales Mix

Sales Mix (per month)	Monthly Net Revenue (₦)	Break-even Time
10 Utility customers	24.25M	~20 months
20 Utility customers	48.5M	~10 months
100 Deluxe customers	48.5M	~10 months
200 Standard customers	48.5M	~10 months
Mixed (10 Deluxe + 5 Utility)	36.4M	~13 months
Mixed (20 Deluxe + 10 Utility)	72.7M	~6.5 months

Assumptions Recap

The assumptions made for the estimations are states as follows:

Fixed Costs: ₦438M annually

Variable Costs: ₦25M + 3% of revenue annually

Break-even Revenue: ₦477M/year (~₦39.8M/month)

Revenue growth pattern is also presented in Table 10.

Year 1: Early adoption (slow ramp-up)

Year 2: Strong scaling (schools, utilities, large households)

Year 3: Expansion (large-scale utility adoption, licensing)

Table 10: Yearly Projection

Year	Focus	Revenue (₦)	Total Costs (₦)	Net Profit (₦)	Notes
Year 1	Build and Market Entry	600,000,000	477,000,000	123,000,000	Break-even crossed, small profit
Year 2	Scaling Adoption	1,200,000,000	601,000,000	599,000,000	Rapid growth with utility clients
Year 3	Expansion and Licensing	2,400,000,000	821,000,000	1,579,000,000	Strong profitability, market leadership

Monthly Break–even Analysis

For an effective net revenues per unit (after 3% fee):

a. Basic Kit (₦145,500)
b. Standard Kit (₦242,500)
c. Deluxe Kit (₦485,000)
d. Utility Kit (₦2,425,000)

The monthly break-even revenue target = ₦39.8M with the proposed break even units to be sold presented in Table 11 and a mixed scenario in Table 12

Figure 11: Break-even units

Plan	Net Revenue per Unit (₦)	Units Needed to Break Even / Month
Basic Kit (1–5 devices)	145,500	274 units
Standard Kit (6–10 devices)	242,500	164 units
Deluxe Kit (11–20 devices)	485,000	82 units
Utility Scale (50+ devices)	2,425,000	17 units

Figure 12: Mixed Scenario

Scenario	Sales Mix (per month)	Monthly Net Revenue (₦)	Break-even State
Entry Focus	150 Basic + 50 Standard	145,500×150 + 242,500×50 = 31.1M	Below break-even
Mid-tier Push	100 Standard + 50 Deluxe	24.25M + 24.25M = 48.5M	Break-even in 1 month
Utility-driven	10 Utility clients	24.25M	Below break-even
Balanced	10 Utility + 20 Deluxe	24.25M + 9.7M = 34M	Slightly below break-

Scenario	Sales Mix (per month)	Monthly Net Revenue (₦)	Break-even State
Mix			even
Strong Utility	20 Utility clients	48.5M	Break-even in 1 month

Relying only on Basic or Standard kits requires very high volumes. Furthermore, the deluxe and Utility sales are the fastest path to monthly break-even. A minimum number of 17 Utility clients per month are enough to cover all costs. This model shows that even modest adoption of Standard and Deluxe Kits achieves break-even quickly. Utility contracts accelerate profitability.

FINANCING

The sources of funding had been personal funds, TETFund Alliance for Innovative Research (TETFAIR) and Nigerian Academy of Engineering (NAEng). Both TETFAIR and NAEng emphasize interdisciplinary collaboration, bridging academia, industry, and government.

TETFund Alliance for Innovative Research (TETFAIR)

The Tertiary Education Trust Fund (TeTFund), in partnership with Innov8 Hub, runs the TETFund Alliance for Innovative Research (TETFAIR). Its a year-long program designed to support academics, researchers, technologists, and innovators from Nigerian government tertiary institutions. The ImoleDe Team were part of the TETFAIR Cohort 4 which held in 2024. The TETFAIR programme provided:

a. Access to funding for prototype development and venture creation, therefore a prototype ImoleDe 1.0 was created.
b. Mentorship from industry and innovation experts
c. Training in business modeling, patenting, and product branding
d. Opportunities to pitch innovations to investors and stakeholders

TETFAIR's focus areas include energy, environment, ICT, and other sectors aligned with the UN Sustainable Development Goals.

Nigerian Academy of Engineering (NAEng)

The Nigerian Academy of Engineering (NAEng) is a leading professional body dedicated to advancing engineering and technology in Nigeria. NAEng supported the innovation through:

a. A National Innovation Competition 2025, where the ImoleDe Team won the third position and a cash prize of Two Million, Five Hundred Naira (N 2,500,000), held June 202 in Lagos. The Cash prize is presently used for the development of a more advanced version of the product, ImoleDe 2.0.
b. Networking and Mentorship: Access to a network of senior engineers and industry leaders.
c. Advocacy and Policy Support: Promoting engineering solutions for national development and facilitating public-private partnerships.

The Team

Our Team is a compact team. Prof. Mrs Dahunsi, a Computer Engineer, brings deep expertise in smart systems. Dr. Olaide, an Electrical Engineer, specializes in energy systems and circuit design. Charles, with a background in Information and Communication Engineering, contributes with his knowledge of wireless and mobile connectivity. Olayiwola, also a Computer Engineer, focuses on cloud integration and app development, ensuring seamless user experience and reliable remote control.

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Socioeconomic and Environmental Impact

The ImoleDe Smart Solar Energy Device and Management System will deliver significant socioeconomic and environmental benefits, directly addressing Nigeria's pressing energy challenges while supporting inclusive development. By providing affordable and reliable power to households, SMEs, schools, and health facilities, the research will expand energy access and reduce the disparities caused by unreliable grid supply. A major benefit is cost savings, as users will be able to reduce or eliminate their dependence on fuel-powered generators, resulting in substantial annual savings on energy expenditures. Local assembly, installation, and maintenance activities will create new jobs across the value chain, thereby enhancing technical capacity, stimulating entrepreneurship, and contributing to Nigeria's industrial development. From an environmental perspective, the system will lower greenhouse gas emissions and reduce air and noise pollution associated with diesel generators, aligning with Nigeria's climate commitments and global sustainability targets. Furthermore, the research reinforces national policy priorities by supporting Nigeria's renewable energy transition and advancing NASENI's mandate to localize technology production, promote industrial growth, and drive sustainable innovation.

The innovation aligns with Sustainable Development Goal 7 - ensures access to affordable, reliable, sustainable and modern energy for all. Lack of access to energy supplies and transformation systems is a constraint to human and economic development. Furthermore, energy efficiency and increase use of renewables contribute to climate change mitigation and disaster risk reduction, thereby maintaining and protecting ecosystems.

With only 45% of Nigeria's population has access to electricity, with significant disparities between urban and rural areas (Source: World Bank). ImoleDe brings an option of efficiency and improved availability of energy supply to consumers during their time of need as a necessity and this can bring numerous societal and economic benefits. These include: improved standard of living, increase in GDP per capita, increase in life expectancy, improved standard of life, higher human development index (HDI), and increased productivity and job creation.

a. Improved Standard of Living

Access to modern energy services is a critical component of standard of living. According to the International Energy Agency (IEA), in 2020: 89% of the global population had access to electricity and 34% of the global population had access to clean cooking fuels and technologies [7].

b. Increase in GDP per capita

Energy access is also strongly correlated with GDP per capita of a Country. According to the World Bank, in 2020: countries with high energy access (above 90%) had an average GDP per capita of $14,333. While countries with medium energy access (50-90%) had $4,333. Countries with low energy access (below 50%) had an average GDP per capita of $1,444 [8].

c. Increase in Life Expectancy

Energy access is also correlated with life expectancy. According to the World Health Organization (WHO), in 2020: Countries with high energy access (above 90%) had an average life expectancy of 77.4 years, while countries with medium energy access (50-90%) had an average life expectancy of 469.4 years. Countries with low energy access (below 50%) had an average life expectancy of 61.4 years [9].

d. Improved Standard of Life

Electricity consumption is a key indicator of standard of life. According to the IEA, in 2020: The average electricity consumption per capita in high-income countries was 12,143 kWh, 2,444 kWh for middle-income countries and 444 kWh low-income countries [7].

e. Higher Human Development Index (HDI)

Human Development Index (HDI) is a composite index measuring standard of life. According to the United Nations Development Programme (UNDP), in 2020: countries with very high HDI (above 0.8) with average electricity consumption per capita of 10,333 kWh. 4,444 kW for countries with high HDI (0.7-0.8) and 1,777 kWh for countries with medium HDI (0.5-0.7) [10].

f. Increased Productivity and Job Creation

Reliable energy supply can increase productivity by 20% and improve competitiveness by 15% . It can also create up to 100,000 jobs in the energy sector (Source: Nigerian Ministry of Power). Only 45% of Nigeria's population has access to electricity, with significant disparities between urban and rural areas [11].

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Conclusion

The Team have developed a unique product which meets an identified need for a Smart Solar Energy Management System. The product will be going through quality tests and initial market reaction has been extremely encouraging. TETFund and the Embassy of Israel through the Innov8 invested in the innovation and business, and the team has invested considerable time and resources over the past year. The business is now ready standardization and usage by her first adopters but cash flow is very tight. Grant support would help to sustain the business over this initial period. We are seeking strategic partnership with private and government organization to establish production, strategic support from the standard organization of Nigeria Certification, grant and investment to get the prototype to the next phase, the small scale piloting and development of the product to the market for early adopters; about 480.5 million Naira (Four Hundred and Eighty Million, Five Hundred Thousand Naira is needed to transform our product ImoleDe from prototype to full-scale production and get to the market. This investment will support the finalization of our mobile application, AI integration, product testing, standardization certifications, infrastructure setup, necessary tools and equipment, product development and deployment, infrastructure, administrative costs, sales and marketing. Developing product to reach about 10,000 people over the first three (3) years and 300,000 subscribers in six (6) years.