

Energy Audit Preparation Guide

How to Prepare for a Professional Solar Energy Assessment in Nigeria

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Table of Contents

1. Introduction
 2. What is an Energy Audit?
 3. Why an Energy Audit is Important
 4. When Should You Request an Energy Audit?
 5. What Happens During an Energy Audit?
 6. Information You Should Prepare Before the Visit
 7. Appliance Inventory Checklist
 8. Business Energy Audit Considerations
 9. Site Assessment Checklist
 10. Common Mistakes That Affect Audit Accuracy
 11. What Happens After the Audit?
 12. Frequently Asked Questions
 13. Final Thoughts
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1. Introduction

One of the biggest mistakes people make when buying a solar system is requesting a quotation before understanding their actual energy needs.

Without accurate information, it is impossible to recommend the right solar solution.

This is why every successful solar project should begin with a professional **Energy Audit**.

An energy audit is the foundation of a properly designed solar system. It helps determine how much electricity you use, what equipment needs backup power, and the most suitable solar solution for your home or business.

This guide explains how to prepare for an energy audit, what information to have ready, and how the results are used to design a solar system that meets your needs.

2. What is an Energy Audit?

An energy audit is a professional assessment of your property's electricity usage.

Its purpose is to understand:

- How much electricity you consume.
- Which appliances use the most energy.
- When electricity is used throughout the day.
- Which equipment requires backup power.
- Opportunities to improve energy efficiency.
- The most appropriate solar system for your property.

An energy audit is not just about counting appliances. It is a detailed evaluation that allows engineers to design a safe, efficient, and cost-effective energy solution.

3. Why an Energy Audit is Important

Every property has unique energy requirements.

A system designed without an energy audit may be:

- Too small to meet your needs.
- Larger than necessary, increasing costs.
- Unable to provide the expected backup time.
- Difficult to expand later.
- Less efficient than it should be.

A professional audit helps ensure:

- Accurate system sizing.
- Better equipment selection.
- Improved system performance.
- Realistic customer expectations.
- Better long-term value.

It also reduces the risk of expensive modifications after installation.

4. When Should You Request an Energy Audit?

An energy audit is recommended if you:

- Are planning to install solar for the first time.
- Want to upgrade an existing solar system.
- Intend to reduce generator fuel costs.
- Need backup power for your home or business.
- Are moving into a new property.
- Plan to build a new house or commercial facility.
- Are experiencing high electricity bills.
- Want to improve your property's energy efficiency.

The earlier the audit is carried out, the easier it is to design the right solution.

5. What Happens During an Energy Audit?

A professional energy audit usually includes the following steps.

Customer Consultation

The auditor discusses:

- Your energy challenges.
 - Your goals.
 - Your budget.
 - Future expansion plans.
 - Current electricity sources.
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Load Assessment

The auditor identifies and records:

- Electrical appliances.
- Power ratings.

- Operating hours.
 - Daily energy consumption.
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Electrical Inspection

Existing electrical infrastructure is reviewed, including:

- Distribution board.
 - Wiring condition.
 - Circuit protection.
 - Earthing system.
 - Generator connection (if applicable).
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Site Assessment

The property is inspected to determine:

- Roof condition.
 - Available installation space.
 - Possible shading.
 - Equipment location.
 - Cable routes.
 - Accessibility.
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Data Collection

The auditor may request:

- Electricity bills.
 - Generator fuel records.
 - Existing solar system details (if any).
 - Building drawings or layouts where available.
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Preliminary Recommendations

Based on the information collected, the customer receives guidance on possible solar solutions and the next steps.

6. Information You Should Prepare Before the Visit

Preparing a few simple documents before the audit helps improve accuracy and saves time.

Electricity Bills

If available, provide electricity bills for the past three to six months.

These help identify:

- Average monthly consumption.
 - Seasonal changes.
 - Electricity costs.
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Generator Information

If you use a generator, record:

- Generator size.
 - Fuel type.
 - Average daily operating hours.
 - Weekly or monthly fuel consumption.
 - Maintenance schedule.
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Existing Solar System Details

If solar equipment is already installed, provide details such as:

- Number of panels.
- Inverter capacity.
- Battery capacity.
- Year of installation.
- Known issues or faults.

Building Information

Useful information includes:

- Property type.
 - Number of floors.
 - Roof material.
 - Available outdoor space.
 - Planned building extensions.
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Future Plans

Inform the auditor if you expect to add:

- Air conditioners.
- Water pumps.
- Refrigerators.
- Production equipment.
- Office expansion.
- Additional buildings.
- Electric vehicle charging.
- Other major electrical loads.

Planning ahead makes future upgrades easier and more cost-effective.

7. Appliance Inventory Checklist

One of the most important parts of an energy audit is identifying the appliances you want to power.

A simple checklist may include:

Lighting

- LED bulbs.
- Outdoor lighting.
- Security lights.

Entertainment

- Televisions.
 - Home theatre systems.
 - Satellite decoders.
 - Gaming consoles.
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Kitchen Appliances

- Refrigerators.
 - Freezers.
 - Microwaves.
 - Electric kettles.
 - Blenders.
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Cooling Equipment

- Ceiling fans.
 - Standing fans.
 - Air conditioners.
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Office Equipment

- Desktop computers.
 - Laptops.
 - Printers.
 - Internet routers.
 - Photocopiers.
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Water Systems

- Borehole pumps.
- Pressure pumps.
- Water treatment systems.

Commercial Equipment

Businesses should also include:

- Industrial machines.
- POS systems.
- Medical equipment.
- Cold rooms.
- Bakery equipment.
- Production machinery.
- Security systems.

The more accurate your appliance list, the more accurate your system design will be.

8. Business Energy Audit Considerations

Commercial energy audits often require additional information.

Examples include:

Operating Hours

- Business opening hours.
 - Shift patterns.
 - Weekend operations.
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Critical Loads

Identify equipment that must never lose power.

Examples:

- Servers.
 - Medical equipment.
 - Refrigeration.
 - Manufacturing processes.
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Seasonal Demand

Some businesses experience higher electricity demand during certain periods.

This should be considered when designing the system.

Business Growth

Future expansion plans should be discussed during the audit.

9. Site Assessment Checklist

During the site visit, the auditor may evaluate:

- ✓ Roof orientation.
- ✓ Roof strength and condition.
- ✓ Available installation space.
- ✓ Trees or structures causing shading.
- ✓ Existing electrical wiring.
- ✓ Distribution board condition.
- ✓ Battery installation area.
- ✓ Inverter installation area.
- ✓ Ventilation.
- ✓ Equipment security.
- ✓ Cable routing.
- ✓ Safety considerations.

These factors influence both system design and installation planning.

10. Common Mistakes That Affect Audit Accuracy

To achieve the best results, avoid these common mistakes:

- Forgetting to mention appliances you plan to buy.
- Underestimating how often appliances are used.
- Hiding generator fuel costs.
- Ignoring future business growth.
- Requesting a quotation without a site inspection.
- Choosing a system based only on your neighbour's installation.
- Providing incomplete information.

Remember, an energy audit is only as accurate as the information provided.

11. What Happens After the Audit?

Once the assessment is complete, the engineering team analyses the collected data.

The customer typically receives:

- Recommended solar system size.
- Suggested inverter capacity.
- Recommended battery capacity.
- Estimated solar panel capacity.
- Preliminary system design.
- Project proposal.
- Cost estimate.
- Expected system performance.
- Installation recommendations.

The audit findings become the foundation for the entire solar project.

12. Frequently Asked Questions

How long does an energy audit take?

The duration depends on the size and complexity of the property. A typical residential audit may take one to two hours, while larger commercial facilities may require more time.

Do I need to be present during the audit?

Yes. It is helpful for the property owner or a knowledgeable representative to be available to answer questions and discuss energy requirements.

Is an energy audit only for new solar installations?

No. Energy audits are also useful when upgrading existing systems, troubleshooting performance issues, or planning future expansion.

Will the audit tell me exactly how much my solar system will cost?

The audit provides the technical information needed to prepare an accurate proposal and quotation. Final costs depend on the selected equipment, system design, and installation requirements.

Can an energy audit help reduce electricity costs even if I do not install solar immediately?

Yes. An audit may identify opportunities to improve energy efficiency, reduce waste, and optimise electricity usage, regardless of whether a solar system is installed.

13. Final Thoughts

A successful solar project begins with understanding your energy needs—not guessing them.

An energy audit provides the information needed to design a system that is reliable, efficient, and tailored to your property.

Whether you are planning a residential installation, a commercial project, or a large industrial facility, investing time in a professional energy audit helps ensure:

- The right system size.
- Better performance.
- Lower long-term costs.
- Greater reliability.
- Easier future expansion.

Most importantly, it gives you confidence that your solar investment is based on facts rather than assumptions.

About EcoSun Energy Solutions

At EcoSun Energy Solutions, every project starts with a professional energy assessment because we believe the best solar systems are built on accurate data and careful planning.

Our engineers work closely with homeowners, businesses, institutions, and developers to understand their energy needs before recommending any solution.

From the initial energy audit to system design, installation, commissioning, and long-term maintenance, we are committed to delivering solar solutions that perform reliably for years to come.

Our Brand Purpose

To provide solar solutions customers can rely on, backed by consistent support they can always reach.

EcoSun Energy Solutions

Smart Energy for the Way You Live.