Drais Energy Nigeria Limited.

DRAIS ALL-IN-ONE SOLAR LIGHT IMPLEMENTATION

Presented By:

Drais Energy Nigeria Limited.

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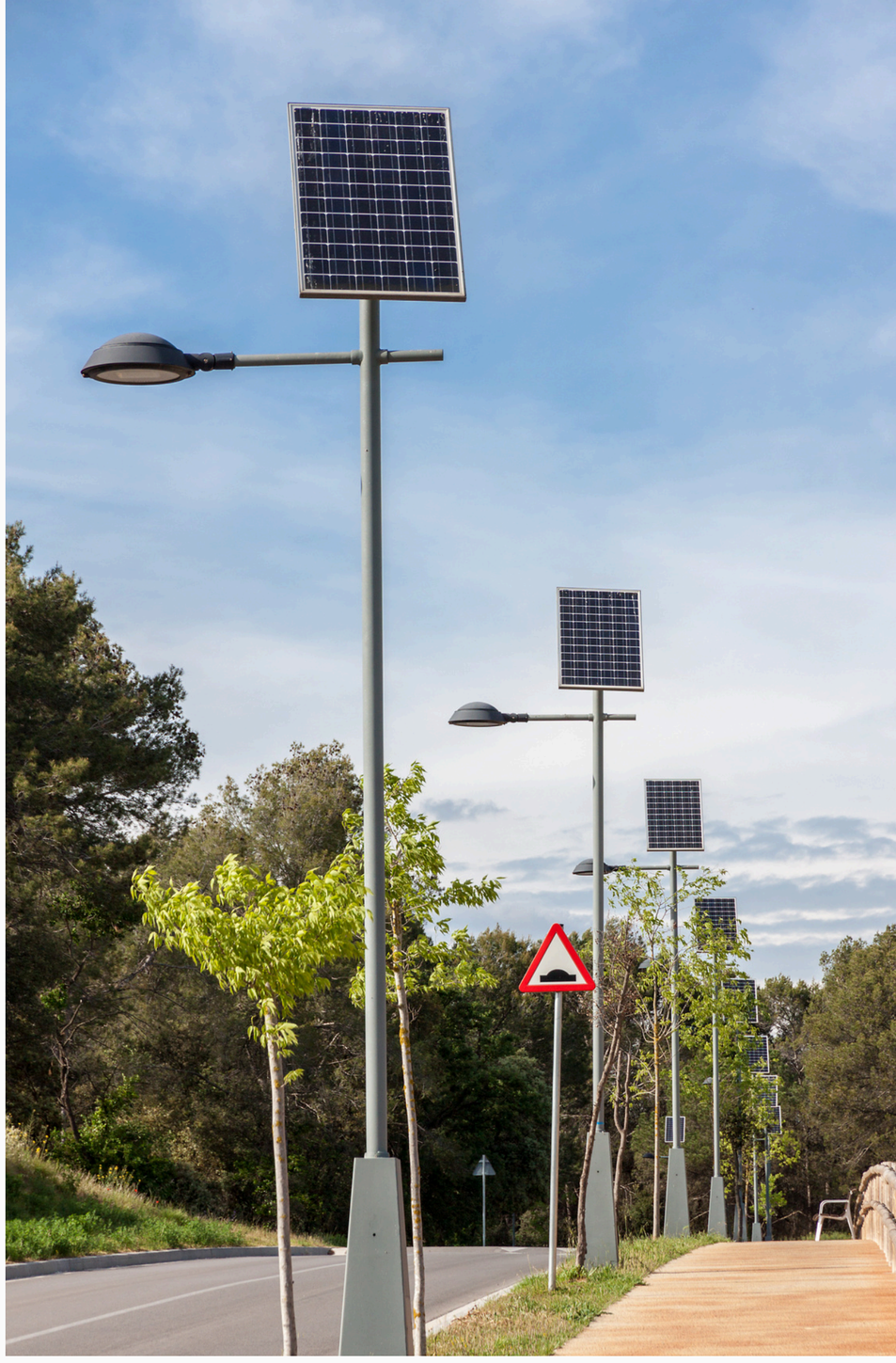
OUR UNDERSTANDING OF ALL-IN-ONE SOLAR STREET LIGHT TECHNOLOGY

Drais Energy Nigeria Limited recognizes that modern street lighting is no longer simply about illumination; it is about delivering sustainable, intelligent, reliable, and environmentally responsible infrastructure that provides long-term value while reducing operational costs. An All-in-One Solar Street Light is a self-contained lighting system that integrates the photovoltaic solar panel, high-efficiency LED luminaire, lithium battery, intelligent charge controller, motion sensor, and lighting control electronics into a single compact weatherproof housing. This integrated design eliminates the need for separate battery boxes, extensive cabling, and grid power connections, making installation faster, simpler, and more economical. The system operates by converting solar radiation into electrical energy during daylight hours through a high-efficiency monocrystalline photovoltaic panel. The generated energy is managed by an intelligent Maximum Power Point Tracking (MPPT) charge controller and stored in an integrated Lithium Iron Phosphate ($LiFePO_4$) battery. At sunset, an automatic light sensor activates the LED luminaire, while the battery supplies stored energy throughout the night. Intelligent motion sensing technology further optimizes energy consumption by increasing illumination only when pedestrian or vehicular movement is detected.

This fully autonomous operating cycle ensures dependable nighttime lighting without reliance on the public electricity grid, thereby reducing energy costs and improving resilience in areas where grid power is unavailable or unreliable.



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OUR TECHNICAL APPROACH TO THE PROJECT

For the proposed Supply and Installation of any number of Solar Street Lights, Drais Energy Nigeria Limited adopts a turnkey engineering approach covering every stage of project execution, from initial planning through commissioning and after-sales support. Our execution methodology includes:

- Detailed engineering and site survey
- Illumination and lighting calculations.
- Pole location planning.
- Foundation design and construction.
- Procurement of high-quality solar lighting systems.
- Logistics and material handling.
- Mechanical installation.
- Electrical integration.
- Functional testing.
- Performance verification.
- Commissioning.
- Client training.
- Warranty support.
- Preventive maintenance.

TECHNOLOGY WE DEPLOY

Our solar street lighting solutions incorporate internationally recognized technologies designed for long-term reliability and superior performance.

High-Efficiency Monocrystalline Solar Panels

The systems utilize premium monocrystalline photovoltaic modules offering high conversion efficiency, superior low-light performance, and excellent resistance to harsh environmental conditions. These panels maximize energy harvesting while maintaining consistent output throughout their operational life.

High-Performance LED Lighting

The integrated LED lighting module provides high luminous efficacy, excellent colour rendering, and uniform light distribution. The LED system delivers bright, dependable illumination while consuming significantly less energy than conventional lighting technologies, with an expected service life of up to 100,000 operating hours.

Lithium Iron Phosphate ($LiFePO_4$) Battery Technology

Energy generated during daylight hours is stored in advanced $LiFePO_4$ batteries renowned for their long cycle life, high safety standards, thermal stability, and deep discharge capability. With a design life of up to 12 years, these batteries minimize replacement costs and support long-term operational reliability.

Intelligent MPPT Charge Controller

Each lighting unit incorporates an intelligent Maximum Power Point Tracking (MPPT) controller that continuously optimizes solar energy harvesting, enhances charging efficiency, protects the battery against overcharging and deep discharge, and manages automatic lighting operation.

Smart Lighting Control

Integrated light sensors automatically switch the lighting system on at dusk and off at dawn without manual intervention. Motion sensing technology intelligently adjusts light output based on pedestrian or vehicular activity, reducing energy consumption while maintaining public safety.

Robust Mechanical Construction

The luminaire housing is manufactured from corrosion-resistant die-cast aluminum alloy with excellent heat dissipation properties. The enclosure is designed to meet IP66 ingress protection standards, providing reliable operation under heavy rainfall, high humidity, dust, and extreme temperatures.

KEY FEATURES OF ALL-IN-ONE SOLAR STREET LIGHTS

The proposed lighting systems provide:

- 150W High-Efficiency LED Luminaire.
- Monocrystalline Solar Panel.
- Integrated $LiFePO_4$ Battery.
- Intelligent MPPT Charge Controller.
- Smart Battery Management System.
- Automatic Dusk-to-Dawn Operation.
- Motion Sensor Technology.
- High-Efficiency Optical Lens.
- IP66 Weatherproof Protection.
- Surge Protection.
- Overcharge Protection.
- Deep Discharge Protection.
- Reverse Polarity Protection.
- Temperature Compensation.
- Intelligent Energy Management.

BENEFITS OF OUR SOLAR STREET LIGHTING SOLUTION

The deployment of our all-in-one solar street lighting systems provides numerous technical, economic, and environmental benefits, including:

- Complete independence from the national electricity grid.
- Zero electricity consumption during operation.
- Significant reduction in operating costs.
- Rapid installation with minimal civil works.
- Elimination of underground cabling.
- Reduced maintenance requirements.
- Reliable operation during grid outages.
- Long equipment service life.
- Enhanced public safety through dependable illumination.
- Reduced carbon emissions.
- Improved environmental sustainability.
- Lower total life-cycle costs.

QUALITY ASSURANCE

Every stage of project execution is governed by rigorous quality assurance procedures. Materials are inspected upon delivery, installations are verified at defined hold points, and comprehensive functional testing is completed before commissioning. Documentation, traceability, and client witnessing form integral parts of our quality management process, ensuring that every lighting unit performs in accordance with project specifications and international engineering standards.

HEALTH, SAFETY & ENVIRONMENT (HSE)

Safety is fundamental to our operations. Drais Energy Nigeria Limited maintains a proactive HSE management system encompassing risk assessments, job hazard analyses, permit-to-work procedures, toolbox talks, personal protective equipment compliance, environmental protection measures, emergency preparedness, and continuous monitoring. Our objective is to deliver every project without harm to personnel, property, or the environment.

OPERATION & MAINTENANCE

To ensure long-term performance, we provide comprehensive maintenance services that include routine inspections, solar panel cleaning, structural checks, battery health assessments, controller diagnostics, firmware updates where applicable, replacement of defective components, and preventive maintenance schedules. These activities maximize equipment reliability and extend service life.

WHY DRAIS ENERGY NIGERIA LIMITED

Clients choose Drais Energy Nigeria Limited because of our:

- Excellent after-sales support.
- Commitment to innovation and sustainability.
- Proven renewable energy expertise.
- Experienced engineering workforce.
- High-quality products sourced from reputable manufacturers.
- Robust quality management systems.
- Strong HSE culture.
- Efficient project delivery methodology
- Competitive pricing.
- Nationwide technical support capability.
- Focus on client satisfaction and long-term value.

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CONCLUSION

Drais Energy Nigeria Limited combines engineering expertise, advanced solar technology, disciplined project management, and a commitment to quality to deliver dependable all-in-one solar street lighting solutions. Our integrated approach—from design and procurement to installation, commissioning, warranty, and maintenance—ensures that clients receive durable, energy-efficient infrastructure capable of providing reliable illumination for many years while reducing operating costs and supporting environmental sustainability.

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