



# Solar Infrastructure Projects in Ethiopia

Lion Green Solutions Ethiopia PLC

*Engineering sustainable access to water and electricity through solar innovation*

## Overview

Lion Green Solutions Ethiopia PLC has played a pivotal role in delivering solar-powered water supply and electrification systems across Ethiopia. As a subcontractor to international firms, we have executed full-cycle technical services — including **site assessment**, **system redesign**, **installation**, and **commissioning** — in the regions of **Amhara**, **Oromia**, **SNNPR**, and **Sidama**.

Our work spans:

- **Solar water pumping systems** in **Kobo**, **Kombolcha**, and **Amdework**
- **Solar mini-grid site assessments** for the **Adele** electrification project

## Solar Water Pumping Systems – Kobo, Kombolcha & Amdework

These projects were part of a UNICEF-funded initiative implemented by an international contractor. Lion Green Solutions was subcontracted to deliver the technical backbone of each site, ensuring high-performance solar water infrastructure tailored to local needs.

### Kobo Site – High-Capacity Surface Pumping System

- **Location:** Kobo, Amhara Region
- **Solar Array:**  $295 \times 390\text{W}$  modules =  $\sim 115 \text{ kWp}$
- **Pump Specs:**
  - Horizontal surface pump
  - 55 kW motor
  - Flow rate:  $46.8 \text{ m}^3/\text{h}$

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- Total head: 245 m
- **Technical Execution:**
  - QGIS-based topographic survey and solar orientation analysis
  - Electrical redesign including inverter calibration and surge protection
  - Installation of RSI inverter (IP54, 45 kW), sine-wave filter, and lightning arresters
  - Civil works for panel mounting, fencing, and controller housing
- **Impact:** Sustainable water access for agriculture and domestic use, serving over 5,000 residents



## Kombolcha Site – Deep Borehole Submersible System

- **Location:** Kombolcha, Amhara Region
- **Solar Array:** 220 × 390W modules = ~85.8 kWp
- **Pump Specs:**

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- Submersible pump
- 55 kW motor
- Flow rate: 14.93 l/s
- Total head: 224.5 m
- **Technical Execution:**
  - Borehole profiling and hydraulic modeling for pump selection
  - Electrical integration with RSI inverter (110 kW), sine-wave filter, and surge protection
  - Installation of control units, earthing rods, and telemetry systems
  - Commissioning with performance testing and flow monitoring
- **Impact:** Reliable clean water for households and institutions, with zero carbon emissions



## Amdework Site – Remote Surface Pumping System

- **Location:** Waghimra Zone, Amhara Region
- **Solar Array:** 295 × 390W modules = ~115 kWp
- **Pump Specs:**
  - Surface pump
  - 55 kW motor
  - Flow rate: 46.8 m³/h
  - Total head: 245 m

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- **Technical Execution:**
  - Site assessment for solar orientation, soil conditions, and load demand
  - Redesign of electrical system with inverter upgrade and cable sizing
  - Installation of sine-wave filters, earthing rods, control lockers, and fencing
  - Full commissioning and training of local technicians
- **Impact:** Reliable water supply for remote communities, reducing reliance on diesel generators



## Adele Electrification Project – Solar Mini-Grid Site Assessments

Lion Green Solutions conducted detailed site assessments for the **Adele solar electrification initiative**, part of the EEU-PPMO-OGU/ADELE/ICB-003 LOT 2 project. These assessments laid the groundwork for solar mini-grid deployment in underserved rural communities.

### Scope of Assessment

- **Regions Covered:** Oromia, SNNPR, Sidama
- **Sites Surveyed:**

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- Haro (Illbabour, Oromia)
- Ori & Mala (West Omo, SNNPR)
- Medayne & Derba (Amaro, SNNPR)
- Lalesa (Chiri, Sidama)

## Technical Methodology

1. **Geotechnical Study:**
  - a. Excavation at 2 points per site (2m depth)
  - b. Soil sampling and laboratory testing (grain size, Atterberg limits, specific gravity)
  - c. Electrical and thermal resistivity testing using Wenner 4-point method
2. **Topographic Survey:**
  - a. GPS and leveling equipment for elevation mapping
  - b. Contour line generation and slope analysis
  - c. Mapping of natural features and access routes
3. **Site Profiling:**
  - a. Vegetation and structure clearance assessment
  - b. Water source identification for construction
  - c. Traffic and logistics planning for equipment delivery
4. **Risk Analysis:**
  - a. Foundation stability
  - b. Panel orientation and tilt optimization
  - c. Inverter reliability and safety protocols
5. **Reporting:**
  - a. Geotechnical and geophysical reports
  - b. Site layout maps and recommendations
  - c. Budget breakdown and mitigation strategies

## Impact

- Enabled precision design of solar mini-grids for off-grid electrification
- Supported government and donor planning with actionable data
- Strengthened community readiness for solar deployment

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## Why Choose Lion Green Solutions?

- **Technical Depth:** From QGIS mapping to installation, we deliver precision engineering.
- **Community Impact:** Our systems serve thousands with clean water and electricity.
- **Scalable Solutions:** Modular designs ready for replication across Ethiopia.
- **Trusted Partnerships:** Proven track record with international contractors and government agencies.

## Let's Build Together

We invite development partners, investors, and government agencies to collaborate with us in scaling clean energy infrastructure across Ethiopia.

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**Lion Green Solutions – Engineering Ethiopia's solar future.**

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