**FINAL (unaudited) report to Fondation Eagle – 3rd October, 2024**

**Solar energy for the Naivasha Technical Training Institute, Kenya**

**Fondation Eagle Reference:** FF 701

**Name of Charity**: Footsteps International (UK registered charity number 1091026)

## Introduction

On 7th December 2023, Fondation Eagle accepted our project proposal and awarded Footsteps International a grant of GBP 12,206. Footsteps added further GBP 1,668 which was held from previous projects, giving a total of GBP 13,212.

The aim of the project was to install a solar energy system to simultaneously reduce running costs, increase productivity, improve security, and reduce environmental impacts.

The project involved sourcing a suitable solar energy supplier, supervising the installation, and monitoring the results.

The **project beneficiaries** the 400 full time trainees, 300 part-time students and 35 staff at the Naivasha Technical Training Institute in Kenya (735 total).

We **received the grant** on 21st December, 2023 as part of a grant of GBP 41,527 for four projects for which we had applied for funding. We **transferred funds** to Kenya on 22nd December, 2023. December 2022. **Installation** was completed during February 2024.

## Project achievements

As soon as all the required materials and equipment were procured, the installation works began, involving the following activities:

1. Installation of solar inventors and power storage batteries;
2. Installation and connection of batteries with sufficient capacities to store enough charge to run the computers and lighting for both administration offices, computer lab and ladies hostels;
3. The inverter and batteries for the male hostel were installed;
4. The inverter for water pumping was installed; this doesn't require storage batteries as water is only pumped in the day.

All equipment was tested and put into operation.


Mr Muli the engineer who installed the solar equipment

Laying the solar panels on the designated roofs where they would receive adequate sunlight. 9 panels for the pumping of water during the day and 8 panels for the administration offices, computer labs and ladies hostels. 4 panels or staff housing, 2 panels for the male hostels.

Security lightings have been installed at strategic locations which automatically switch on in the evening and off again in the morning.


NTTI Front office security lighting

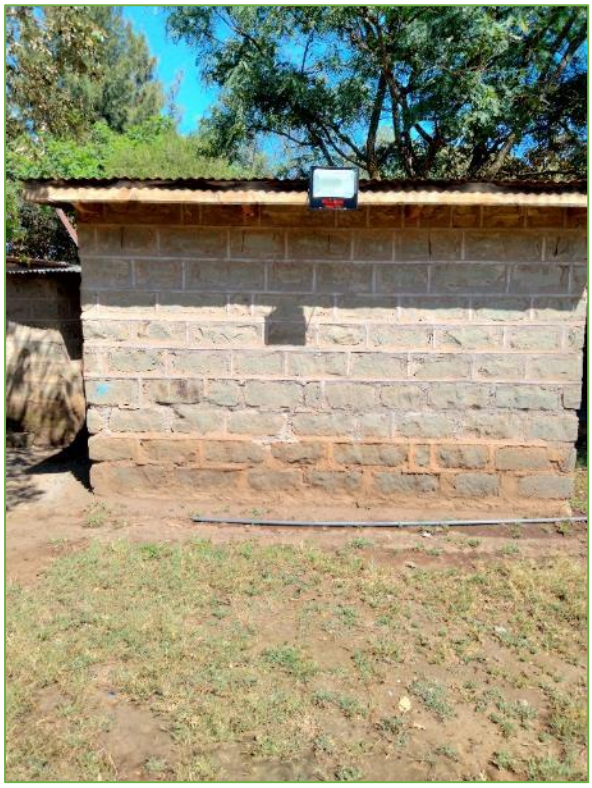
Solar powered computer for Nancy our back office secretary


Food and Beverage centre security lighting

NTTI ICT practical room


Plumbing and Masonry lecture hall


Men’s hostel solar and security lighting

Rest rooms security light for ladies hostels

Borehole solar panels and the inverter at the borehole pump room

Staff member Lorot Ajiot in the borehole room ready to pump water

Digital Library solarisation of the security lights, computers and their internet



Staff quarters


## Project achievements

a) Security lighting: The compound is much safer as it remains lit even during power outages, unlike in the past when the entire compound would be plunged in total darkness.
b) Computers for both administration offices and the learning in the computer lab are never interrupted during power outages. This has really helped, since computer packages students have not been disadvantaged as they were previously when many hours would be wasted waiting for power reconnection.
c) Supply of water is never in short supply like before. The borehole water storage tank has never lacked water as was the case before the installation of the solar water pumping system.
d) The student hostels remain lit at night during grid power outages as compared to before where boarding students would use their cell phone torches to cook and light their rooms. There is always lighting.
e) Electricity bills have dropped drastically by 30% and 40% in the months of March and April respectively. In April we experienced a lot of cloudy weather and rains that hindered full charging of the batteries and 100% solar water pumping. It's our belief that when the weather reverts to 80% sunlight, the power bills will drop further. The saving is a great help as it releases money to be used for training purposes.
f) The project enhances the sustainability credentials of NTTI and provides the trainees with an increased awareness of the need to care for the environment by using non-carbon based fuel sources.

## Expenditure summary

Our estimated cost for the project was 2,444,300 Kenya Shillings (KES) at an exchange rate of GBP 1 = KES 185. We received the grant on 21st December, 2023 as part of a grant of GBP 41,527 for four projects for which we had applied for funding. We transferred funds to Kenya on 22nd December, 2023, obtaining an actual exchange rate of GBP 1= 197.4 KES.

Our project team delivered the project for KES 2,444,460, a very small overspend of 160 KES. However, overall, the project was delivered with an **underspend of GBP 829** against the budget; this was the result of a favourable exchange rate when we transferred the funds to Kenya, and tight budget control.

The table below provides a detailed breakdown of the budgeted and actual expenditure (overspends are shown as negative figures).

| | | | | | *Exchange rate* | *185* | | *197.39* | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **NTTI solar installation** | | | | | **Budget** | | **Actual** | | | |
| **Office, ICT labs, Girls Hostels** | | | | | | | | | | |
| **Ref** | **Description** | **Qnty** | **UoM** | **Price** | **Est cost KES** | **Est cost GBP** | **Actual cost KES** | **Actual cost GBP** | **Variance KES** | **Variance GBP** |
| 1 | 200AH Gel Tubular batteries | 4 | Lot | 40,000 | 160,000 | 865 | 146,000 | 740 | 14,000 | 125 |
| 2 | 560 WP Solar Panels- Jinko | 16 | Lot | 25,200 | 403,200 | 2,179 | 392,320 | 1,988 | 10,880 | 192 |
| 3 | 5 KVA TBB low frequency Hybrid Inverter - | 2 | Lot | 140,000 | 280,000 | 1,514 | 280,000 | 1,419 | 0 | 95 |
| 4 | Electrical intergration gear: Cables and fittings | 1 | No. | 75,000 | 75,000 | 405 | 78,000 | 395 | -3,000 | 10 |
| 5 | Mounting structure :aluminum solar and steel battery rack | 1 | No. | 90,000 | 90,000 | 486 | 90,000 | 456 | 0 | 31 |
| 6 | Solar flood lights 100 watts | 16 | No. | 10,500 | 168,000 | 908 | 228,480 | 1,158 | -60,480 | - 249 |
| 7 | Installation labor and transport | 1 | No. | 55,000 | 55,000 | 297 | 45,000 | 228 | 10,000 | 69 |
| | **TOTAL** | | | | **1,231,200** | **6,655** | **1,259,800** | **6,382** | **-28,600** | **273** |
| | | | | | | | | | | |
| **Mens' hostels, 2staff quarters, Lights +TV** | | | | | | | | | | |
| **Ref** | **Description** | **Qnty** | **UoM** | **Price** | **Est cost KES** | **Est cost GBP** | **Actual cost KES** | **Actual cost GBP** | **Variance KES** | **Variance GBP** |
| 1 | 200AH Gel Tubular batteries | 6 | Lot | 40,000 | 240,000 | 1,297 | 219,000 | 1,109 | 21,000 | 188 |
| 2 | 560 WP Solar Panels- Jinko | 6 | Lot | 25,200 | 151,200 | 817 | 147,120 | 745 | 4,080 | 72 |
| 3 | 1 KVA Hybrid Inverter - | 3 | Lot | 35,000 | 105,000 | 568 | 105,000 | 532 | 0 | 36 |
| 4 | Electrical intergration gear: Cables and fittings | 3 | No. | 15,000 | 45,000 | 243 | 45,000 | 228 | 0 | 15 |
| 5 | Mounting structure: aluminum solar and steel battery rack | 3 | No. | 15,000 | 45,000 | 243 | 45,000 | 228 | 0 | 15 |
| 6 | solar flood lights 100 watts | 3 | No. | 10,500 | 31,500 | 170 | 31,500 | 160 | 0 | 11 |
| 7 | Installation labor and transport | 1 | No. | 60,000 | 60,000 | 324 | 60,000 | 304 | 0 | 20 |
| | **TOTAL** | | | | **677,700** | **3,663** | **652,620** | **3,306** | **25,080** | **357** |
| | | | | | | | | | | |
| **Solar water pumping** | | | | | | | | | | |
| 1 | 5.5KW SOLAR WATER PUMPING INVERTER | 1 | No. | 85,000 | 85,000 | 459 | 95,000 | 481 | -10,000 | - 22 |
| 2 | 340 WP SOLAR PANEL | 18 | No. | 15,300 | 275,400 | 1,489 | 257,040 | 1,302 | 18,360 | 186 |
| 3 | PV COMBINER BOX | 1 | No. | 15,000 | 15,000 | 81 | 20,000 | 101 | -5,000 | - 20 |
| 4 | CABLES AND INSTALLATION MATERIALS | 1 | Lot | 35,000 | 35,000 | 189 | 35000 | 177 | 0 | 12 |
| 5 | MOUNTING STRUCTURE-ROOF MOUNT | 1 | No. | 85,000 | 85,000 | 459 | 85,000 | 431 | 0 | 29 |
| 6 | TRANSPORT AND INSTALLATION LABOUR | 1 | No. | 40,000 | 40,000 | 216 | 40,000 | 203 | 0 | 14 |
| | **TOTAL** | | | | **535,400** | **2,894** | **532,040** | **2,695** | **3,360** | **199** |
| | | | | | | | | | | |
| | **GRAND TOTAL** | | | | **2,444,300** | **13,212** | **2,444,460** | **12,384** | **-160** | **829** |

## Summary of project successes and benefits

**Successes:**

As noted above, the project has already delivered higher productivity in the office, improved night security, reduced energy costs, an enhanced environmental credentials. The energy cost reduction is expected to get even better after the rainy season ends.

**Challenges:**

The project was delivered smoothly, with no major challenges.

## Conclusion and thanks

The solar installation has enhanced the security of the institution, and the students feel more secure with lights on during power grid outages. Water, a critical commodity, is always in supply unlike before, so washing and cooking by the students is assured.

Use of computers and internet for the office work and studies is now uninterrupted courtesy of the solar installation. Grid power bills have begun to drop helping the institution to cut cost of energy and releasing funds for use elsewhere. The project is 100% complete as the photos indicate. We really appreciate this very kind gesture from Eagle Foundation through Footsteps International.

We are pleased to include a letter of thanks from the student vice-president:

APPRECIATION NOTE

On behalf of AIC Naivasha Technical Training Institute cabinets, I as the Deputy president would like to extend our heartfelt gratitude for your generous donation of solar lights. Your support has brought about significant positive changes to our school community.

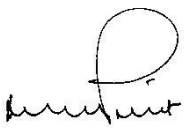
The installation of solar lights has greatly enhanced the safety and security of us students and staff. With the extended 'daylight hours, we students can now participate in after-school activities and study sessions without worrying about inadequate lightning. This improvement has not only contributed to better academic perfomance but also to the only overall well-being of everyone in the school.

We are incredibly grateful for your partnership and positive impact that it has had in our school. Your investment in our school will have lasting benefits for many years to come.

Thank you once again for your generosity and support.

from: vice president HTTI and
CS internal ladies internal Affairs

**Signed (Martin Print, Trustee):**



**Date**: 3rd October 2024