

PRE-FEASIBILITY STUDY REPORT FOR SOLAR POWER GENERATION PROJECT MAI MAHIU AREA, KENYA.



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Development Consultant (Pre-build Stage): Ecoplan Kenya Ltd.
To accompany FIT application EOI -



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ABSTRACT

A prefeasibility study of a solar power plant project was carried out by us Eco Plan Kenya Ltd, the appointed Consultancy Company of Kenyalight-Project Ltd in May 2015 in order to study and search the best location to install a concentrated solar power plant in Nakuru. The investors were determined to obtain a site with a maximum possible irradiation.

Kenya's Vision 2030 is the national development blueprint, initiated to transform the country into a newly industrializing, middle-income economy by the year 2030. The Vision is founded on three pillars of economic, social and political development. The economic pillar is aimed at improving the living standards for all Kenyans through an economic development program, through which the country is expected to achieve an average Gross Domestic Product (GDP) growth rate of 10% by the year 2030 [Government of Kenya (GoK), 2007].

The level of economic development determines the intensity of energy use; as economic systems in developing countries expand, so is the demand for energy to power production activities (Winkler, 2005; UN-Energy/Africa, 2011). The Kenya Vision 2030 identifies energy as one of the key infrastructural enablers, necessary for the realization of its objectives (GoK, 2007; 2012a). In view of this, the economic development program mooted in the Vision is expected to increase demand on Kenya's energy supply.

Currently, energy shortages and supply disruptions coupled with high cost remain serious obstacles to the manufacturing sector (GoK, 2012a). In liberalized markets, the cost of energy significantly influences the competitiveness of local products vis-à-vis imported goods. Consequently, a high cost of energy negatively affects domestic wealth creation, balance of payments and employment creation, as consumers opt for cheaper imports (GoK, 2012a; Karekezi and Kimani, 2009). This scenario necessitates the establishment of new projects to step-up energy supply at a lower cost and increase efficiency in energy consumption (GoK, 2012a). Universal access to sustainable, affordable and clean energy is instrumental for the realization of Kenya's Vision 2030 (GoK, 2012a).

The main objective of this project is to generate power and to feed it into the National Grid and in return earn revenue through PPA agreement with the electricity distributor which is in this case the Kenya Power and Lighting Company Ltd.

Normally, eleven years of solar irradiation data from an on-ground weather station is needed for site assessment, such data was derived from the Nairobi based meteorological station which is about 40km S.East of Mai Mahiu Town. In this case, the technical team also used satellite imagery in order to have the accurate value for the right evaluation of the site. Some better satellite imagery generated solar maps are attached to this report as indexes.

1. INTRODUCTION

This project is known as the Proposed Mai Mahiu Solar Power Generation Plant. It is located adjacent to Mai Mahiu Shopping Centre, approximately 300m off the Old Naivasha Road. Its geographical coordinates are within the range of 0° 58'16.55"S 36 ° 35'15.91"E and address is Kubai Farm, Kijabe/ Kijabe (Mai Mahiu) Block 3245, Kijabe Mai Mahiu Road, Nakuru, Kenya.

The project is intended to produce approximately 25MW of power.

Kenya's current effective installed (grid connected) electricity capacity is approximately 2,294[1] MW. Electricity supply is predominantly sourced from hydro and fossil fuel (thermal) sources.

Just until recently the country lacked significant domestic reserves of fossil fuel. The country has over the years had to import substantial amounts of crude oil and natural gas. This might change with the discovery of oil reserves in Kenya, which relied on oil imports to meet about 42 percent of its energy needs in 2010. Connectivity to the national grid in Kenya currently stands at 23% according to World Bank.

In Kenya, there are plans by the government to end the monopoly of the electricity distribution market but until that happens, power distribution is only held by one company:

- Kenya Power

However power generation is done by the Kenya Electricity Generating Company (KenGen) which is the major Company controlling about 90% of Installed Capacity. However, there are other smaller Independent Power Producers (IPPs) who produce about 10% of Installed Capacity):

- (i) Westmont
- (ii) Iberafrica
- (iii) OrPower4 (Kenya) subsidiary of Ormat Technologies
- (iv) Tsavo Power Company (TPC)
- (v) Aggreko
- (vi) Africa Geothermal International (AGIL)[6]

Few companies have embarked on a major solar power generating installations in Kenya which is fed to the national grid through PPA and FiT agreements and therefore the Kenya Light Project Ltd, hereby referred to as the applicant for the FIT will be the pioneer company to venture in to this kind of a worthy investment from Alpin Sun GmbH funders. Discussions have taken place with the University of Nairobi and they have offered valuable support to the KENYALIGHT-PROJECT LTD projects in Nakuru districts and together with Eco Plan Kenya Ltd who will produce the necessary Environmental Impact Assessment Reports (EIA's), Power Purchase Agreements (PPA's), Feed-in Tariff Agreements (FIT's – we are using \$0.12 KWh) and Grid connection negotiation and applications.

2. DESCRIPTION OF PROJECT AREA

(a) Project location with coordinates and relevant site maps.

The project is located in Mai Mahiu area of Nakuru County. It is adjacent to the Mai Mahiu shopping centre to the North and the kikuyu escarpment and forest to the East.

Its geographical coordinates are within the range of 0° 58'16.55"S 36 ° 35'15.91"E.

The land consists of four different but adjacent parcels of land which are owned by Kiragu Kubai on free hold titles. The four parcels of land which make up the total land area of 100 acres (40.46 Hectares or 404, 687m²) are as follows;

- L.R KIJABE/KIJABE/BLOCK1/3242 -67.77Acres (27.38 Ha)
- L.R KIJABE/KIJABE/BLOCK1/3245 -18.53Acres (7.49Ha)
- L.R KIJABE/KIJABE/BLOCK1/3246 -9.97Acres (4.03 Ha)
- L.R KIJABE/KIJABE/BLOCK1/3249 -5 Acres (2.02 Ha)
- (Christina Gakuhi Kubai owning Block 1/3242: the 67.77 Acres).

(Site maps are attached separately as an accompaniment to this report).

(b) Physical & Salient features of the project site

The project will be located on a 100 acres piece of land. This particular land is located at the base of the Rift Valley. Towards the East lie the Kikuyu Escarpment and the bushes on these hills.

There are small streams that flow within the locality. These rivers are called Nasaia, Matasia and Ewaso kendong rivers. The Nasaia river flows along the Northern boundary of this particular parcel of land. However, these are small seasonal rivers.

The vegetation cover

The vegetation existing on the land comprises of short thorny bushes which is a characteristic of a semi-arid climate. Some of the species of plants found in the area include Acacia, Cactus, Sodom Apple and short grass among other dry areas plants.

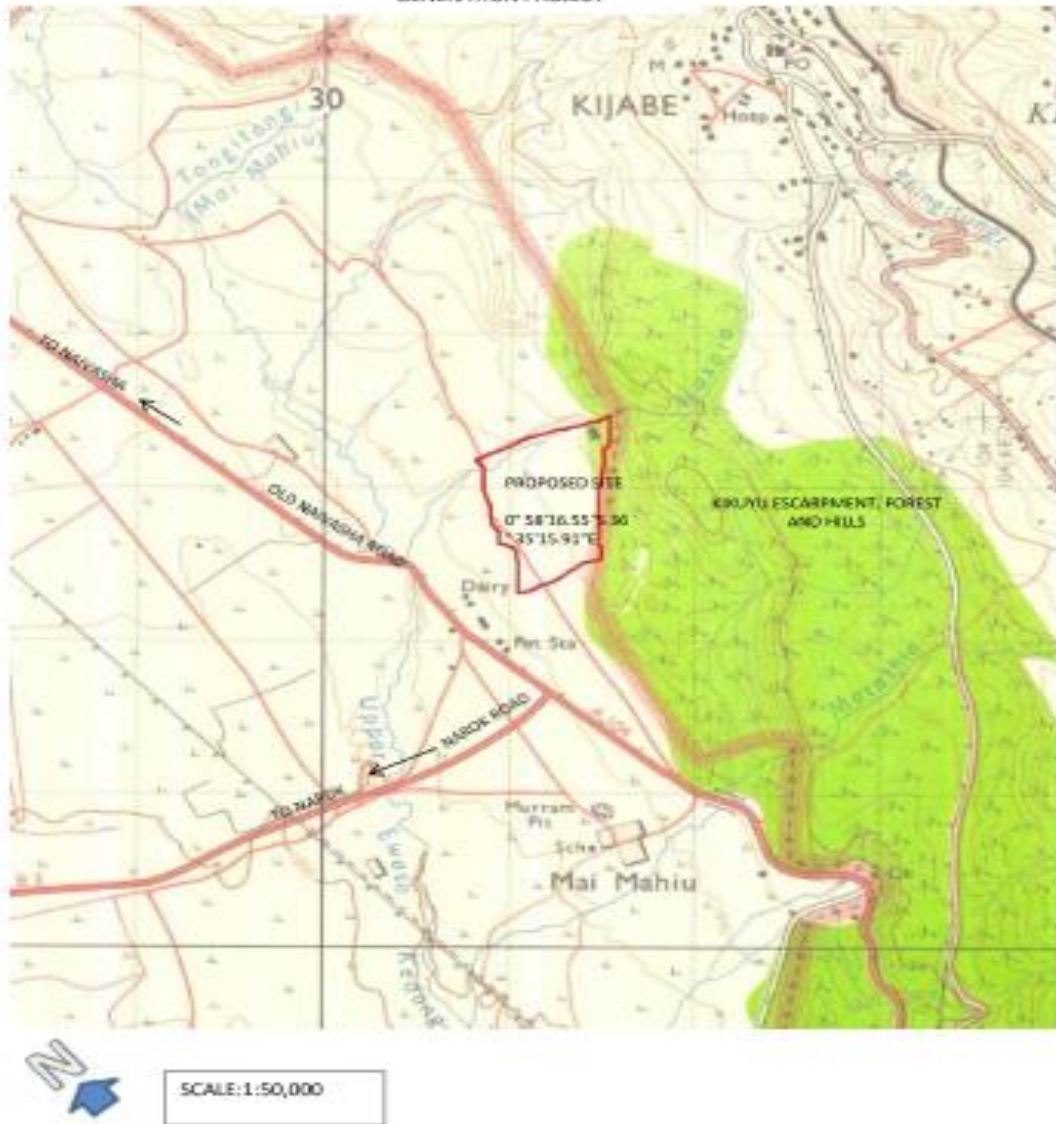
The Photo Plates below show the vegetation cover on the said land;



The Photo Plates below show the vegetation cover on the said land;



LOCATION PLAN FOR THE PROPOSED SITE FOR MAI MAHIU SOLAR POWER GENERATION PROJECT



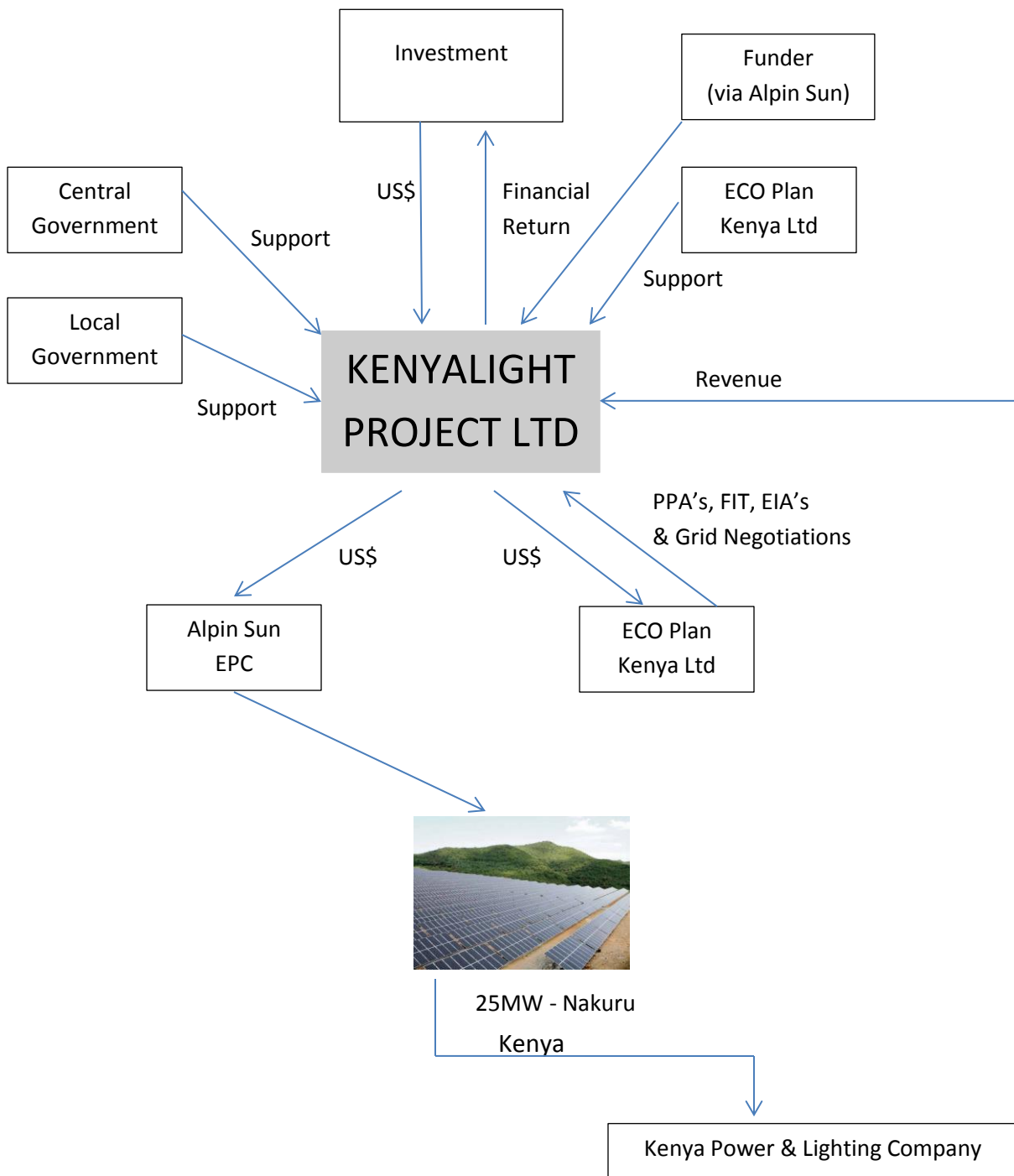


SCALE: 1:50,000



The yellow pin marker represents the large Sub station connection for the Solar Farm

3. Consortium of parties involved



KENYALIGHT-PROJECT LTD

We have already secured an authorisation letter obtained from the respective County Government together with specific support after discussions with the main Energy Minister in Kenya, we aim to develop the Nakuru 25MW Solar Farm for the KENYALIGHT-PROJECT LTD. Alpin Sun GmbH we have appointed as our EPC company to build the solar farms, they will be exempt of any import duty associated with technology required for all equipment including the PV panels.



JOSEPH (JOE) MWAI

Co-founder & Managing Director of Kenyalight-Project Ltd - Joe Mwai (centre)

Pictured at Kenya London Embassy in London



Carole Mwai

Project communication & Legal Secretary

An EPC company requirements –

Project Development

- Land owner and land rights (lease, purchase)
- Permits: EIA, grid connection, PPA and building permit, etc.

Site and connection data

- Coordinates: - 1° 11' 43.461" 36° 33' 59.832" and also the other site 0° 58'16.55"S 36 ° 35'15.91"E
- Exact size / dimensions
- Soil conditions / description, vegetation
- Drawings (including contour lines), preferably in .dwg format
- Pictures
- Grid connection point
 - Location
 - Specifications (voltage level, grid parameters, grid stability)

Commercials

- PPA terms and conditions
 - Status of negotiations / references
 - Duration
 - Compensation / unit
 - Currency
 - Escalators (e.g. inflation)
 - Counterpart / securities
- Other income streams
 - Green certificates, etc
- Taxes / charges on
 - Income
 - Power
- Doing business
 - Founding entities
 - Licenses for construction / operation
 - Local content requirements
 - Drawing money outside the country
 - Subsidies
- Other support measures
 - Potential financing or securing partners

Cooperation

- Your role and scope of services
- Your expectation of our role and responsibility
- Other parties involved
- Project development funding
- Cooperation agreement

Any and all other An EPC company requirements will be met

Kenya, a combination of huge solar resources, three times radiation levels compared to Europe, limited grid capacity and growing demand for power driven by one of the world's fastest growing economies provides all the right ingredients for an African solar explosion. In the same way that mobile phones have taken off in Africa, so solar, with its potential for off-grid and decentralised deployment, offer similar opportunities for propelling forward the continent's development of Solar Farms. The largest share of Kenya's electricity supply currently comes from hydroelectric stations at dams along the upper Tana River, as well as the Turkwel George Dam in the west. Shortfalls of electricity occur periodically, when drought reduces water flow. In 1997 and 2000, for example, drought prompted severe power rationing, with economically damaging 12-hour blackouts. Frequent outages, as well as high cost, remain serious obstacles to economic activity, hence the strong Government support for solar farms. Kenyan electricity needs are also currently supported by a petroleum-fired plant on the coast, geothermal facilities at Olkaria (near Nairobi), and shortfall covered in the form of expensive imports from Uganda.

There is a growing and urgent need for Solar Farms in Kenya, electricity demand is significantly rising mainly due to accelerated productive investment and increasing population. Historically, energy demand is positively correlated with economic and population growth rates, an opportunity that KENYALIGHT-PROJECT LTD are developing will take advantage of these growth rates. Currently the electricity demand in Kenya is 1,191MW against an effective installed capacity of 1,429MW under normal conditions. The peak load is projected to grow to around 2,500MW by 2015 and 15,000MW by 2030. To meet this demand, the projected installed capacity should increase gradually to 19,169MW by 2030 by utilising renewable energy technologies such as the KENYALIGHT-PROJECT LTD Solar Farms. Kenya has entrenched a very strong foundation on renewable energy investment stability within the new constitution. The state-owned Kenya Electricity Generating Company (KenGen), established in 1997 under the name of Kenya Power Company, handles the generation of electricity, while the Kenya Power and Lighting Company (KPLC) handles transmission and distribution.

The way forward - We have developed the "Resource Ownership" concept for Kenya the solar farm at Nakuru, where the Local Government and peoples in an area of the solar farm would receive 1% of revenue from the solar farm together with 1% revenue share also going to the landowner – this ensures Sustainable Energy development for Kenya. This initial request for the FIT is a request for one solar farm in Nakuru Kenya.

KENYALIGHT-PROJECT LTD have created, over a three year development period a Solar PV market opportunity in Kenya. The solar farm projects will form part of the 5,000MW capacity the Kenyan Government have targeted. KENYALIGHT-PROJECT LTD is well positioned to build the solar farm alongside our German partner of choice and EPC company Alpin Sun GmbH (Alpin), to provide very significant revenue streams and profit margins. Alpin are known by their peers as one of the best companies in the solar farm sector due to their technology choice, pricing and delivery values. KENYALIGHT-PROJECT LTD has had discussions with the Minister at Central Government. These discussions have assisted us in the Nakuru solar farm development and the timely and favourable Power Purchase Agreement (PPA) submissions are now being made.

KENYALIGHT-PROJECT LTD has also garnered major political support in principal from the Kenyan Government who have stated its aim is to oversee solar as a major contributor to the country's electrical generation requirements and specifically has aligned himself to the success of KENYALIGHT-PROJECT LTD's development programme. In addition to Central Government support, KENYALIGHT-PROJECT LTD has alliances at the County Governmental level and has already obtained a local letter of authorisation together with land assigned to the first project in Nakuru.

Just how is KENYALIGHT-PROJECT LTD going to achieve its development programme? Having established senior in-country links and the entry route, KENYALIGHT-PROJECT LTD is now positioned to attract investment to its project in Nakuru which is ready for roll-out. The identified location at Nakuru is optimal to generate the maximum capacity of electricity over a 25-year life cycle directly into the central electricity grid.– for this 25MW Solar Farm project in Nakuru we require \$41 million for the build phase (Alpin Sun GmbH) costs, and all other costs including start-up costs bring total build stage costs to \$48.2 million plus KSH 25,000,000 or \$268,355 pre build phase with investment in the form of either debt, equity of some form of negotiated hybrid to suit; refer to Financial section and also the separate financial xls. For further details.

The very significant revenues from a solar farm are generated due to the Feed-In-Tariff and in the case of the 25 MW project \$91,520,113 million over twenty five years, the most obvious benefit of the feed-in tariff in Kenya is the potential for added capacity for renewables. According to the European Investment Bank Renewable Energy Performance Platform REPP the maximum capacity that the feed-in tariff will subsidize is 1,750MW added over the course of 20years. According to the United Nations Environment Program UNEP, it is reasonable to expect that the feed-in tariffs will stimulate 1,300MW of installed power capacity. The African continent arguably has the most to gain from the deployment of solar as an energy source as radiation levels are three times that of Europe and KENYALIGHT-PROJECT LTD is positioned to take advantage of this factor.

4. History

Senior staff now at KENYALIGHT-PROJECT LTD, namely Alan Brewer MSc was asked in 2012 by Joe Mwai to assist the Nakuru project and in 1995 he was asked to research and write one of the first UK City Energy Policies and Strategies to combat Climate Change. This work led onto his coordination of the Hampshire County Council Energy Network in 2002, progressing onto Sustainable Energy in the County Schools sector. The concept of Resource Ownership was born.

Following a period of time researching solar in the UK, developing PV in both domestic and business environments it became apparent that for true sustainability and commercial profitability, solar technology really needed greater radiation levels to optimize its benefits than that available in the climate across the UK and the majority of Europe. Africa was an ideal location and given Kenya's past history as a British Colony and political system similar to that of the UK, the country became the target of Alan's interest.

He formed the Kenyalight project; a company partnering with Joe Mwai, a Kenyan National, businessman with an interest in environmental work and climate change mitigation and today a joint director of KENYALIGHT-PROJECT LTD. Both Alan and Joe put their undoubted solar expertise and local knowledge to work in aid of the indigenous Maasai people of Kenya. The worthy cause was to assist in replacing the use of dangerous and toxic kerosene used for lighting with small solar PV panels, enough for each household to run a light and perhaps telephone charger. The project was successful and Alan and Joe learnt a lot about the Kenyan electricity issues and made valuable contacts.

Kenyalight were approached in 2012 by Tobias Panofen Project Coordinator of the Frankfurt School of Finance & Management gemeinnützige GmbH, an appointed organisation of the United Nations Environment Programme – Renewable Energy Performance Platform to assist in the development of Solar PV First Mover projects and they fed into this programme technical information on Solar Farms. The UNEP – REPP programme has enabled the current development of sixteen First Mover solar farm tender projects in Kenya.

Alan and Joe's hands-on work eventually lead them to an introduction to the Ministry in Nairobi and discussion for their development work took place to understand the Governments opinions. Following numerous meetings and discussions we will develop the 25MW Solar Farm for Nakuru to support Kenya's economic growth. Alan and Joe partnered in KENYALIGHT-PROJECT LTD in 2014 to drive this project forward.

As indicated we have developed the Resource Ownership concept for the Nakuru - Kenya solar farm, where the Local Government and peoples in an area of the solar farm would receive 1% of revenue from the solar farm together with 1% revenue share also going to the landowner – this ensures Sustainable Energy development for Kenya. Several meetings have been held with the state owned electricity companies, the Governments Minister for Energy, local Government officials and the Deputy President of Kenya to garner the necessary top-level support and driving forces behind the projects that are now offered for investment. Investors have now been identified to assist with funding stage one – Pre Build costing KSH 25,000,000 (\$268,355).

5. Registration Certificate Kenyalight Project Ltd



No. CPR/2014/137084

CERTIFICATE OF INCORPORATION

I hereby CERTIFY, that -

KENYA LIGHT PROJECT LIMITED

is this day Incorporated under the Companies Act (Cap. 486) and that
the Company is **LIMITED**.

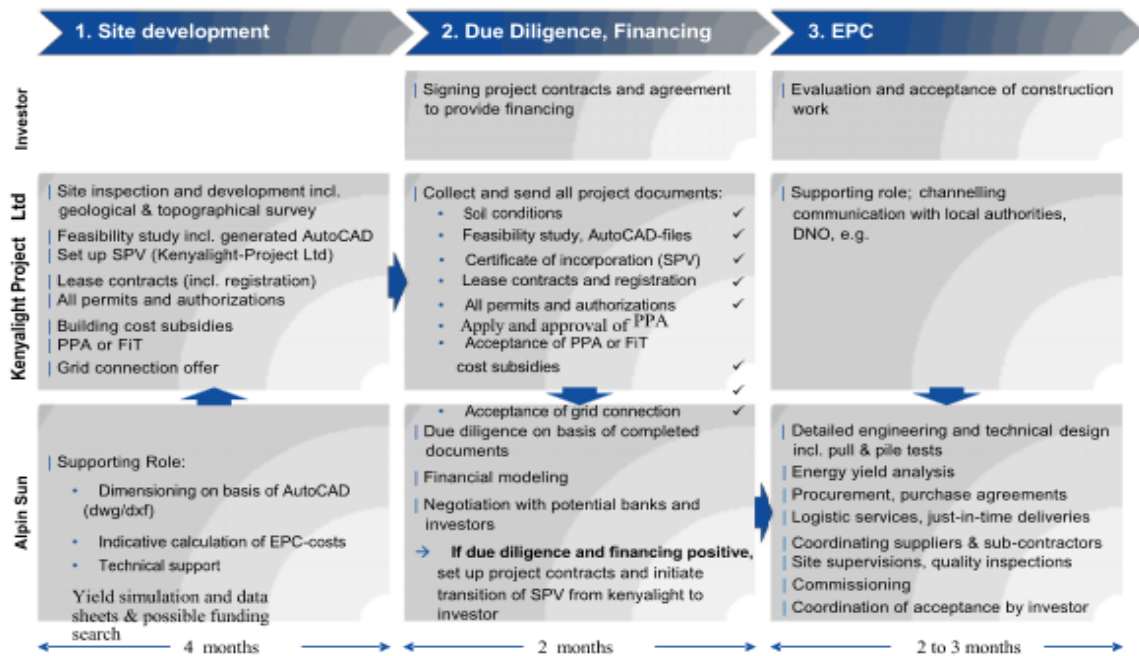
GIVEN under my hand at Nairobi this **27th** day of **March**
Two Thousand and **Fourteen**


Registrar Of Companies

6. Flow chart of responsibilities



Distribution of responsibilities between Kenyalight Project Ltd & Alpin Sun GmbH on a project flow chart



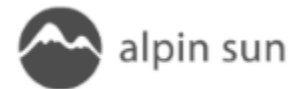
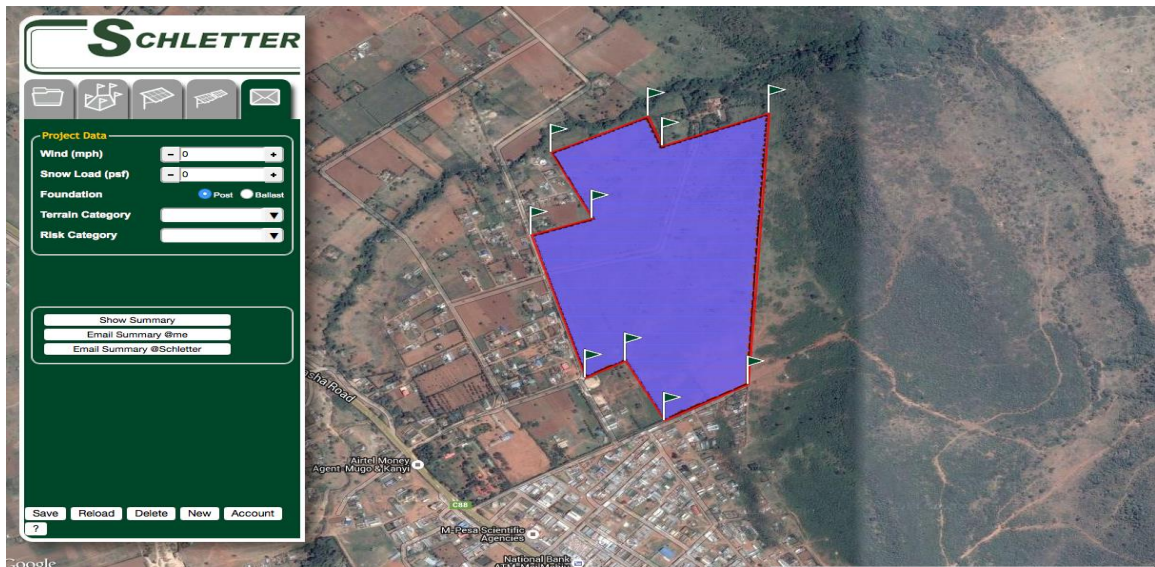
7. TECHNICAL PARAMETERS

Kenya being astride the equator and extending four degrees on either side, receives a considerable amount of solar radiation. Early assessment by Ministry of Energy indicated that the country received on average 4.5 kWh per square meter per day.

The said project location has considerable amount of solar radiation and therefore it is a good site for solar installation of the said 25MW project. The technology to be used and all the technical aspects which include drawings and tables of expected solar irradiation levels are attached to this report as an appendix.

Our EPC Company





Project Proposal

Project Outline

25MW Solar Farm based at Mai-Mahiu in Nakuru.

Enclosed in this Alpin Sun document are the figures and timings and responsibilities for our EPC work on the Mai-Mahiu Solar Farm.

Alpin Sun GmbH is offering a wide range of skills and experience to accomplish the outlined works below. The following document when signed, agrees both parties, until both mutually agree to break the contract, is a contract for all the works included below, unless not adhered to by one of the parties.

Alpin Sun will become the main contractor and retains the right to sub contract out any part of the below agreement. Alpin Sun will oversee all of their work from their main office.

Engineering Design

- Detailed drawings from our experienced design engineers, including accessibility and logistical requirements.
- All structural Calculations.
- Capacity Calculations.
- All electrical calculations.
- Design decisions will be discussed and made which are best for the system in terms of maintenance, efficiency, cost and the environment.

Procurement

Using a well-researched and tested supply Chain, Alpin Sun will utilize its relationships to provide the smooth running of the procurement procedures. Alpin Sun, as outlined below, will provide all the parts for the construction of the site, whether through existing or new contacts.

Construction

For the construction work, Alpin Sun will be the primary contractor for the work; so will take care of other contractors and responsibility for the work carried out on site. This will also be solely down to Alpin Sun, regarding who they choose and the volume of work they contract out. However, Kenyalight-Project Ltd can recommend and assist with the search for local contractors, if this work is needed to be carried out.

Communication will need to be frequent between Kenyalight-Project Ltd and Alpin Sun to ensure all permits, surveys and land layouts are produced by Kenyalight-Project Ltd and they can be transmitted to Alpin Sun to ensure compliance, so both parties can ensure agreement with the design and local authority regulations and electrical contractors.

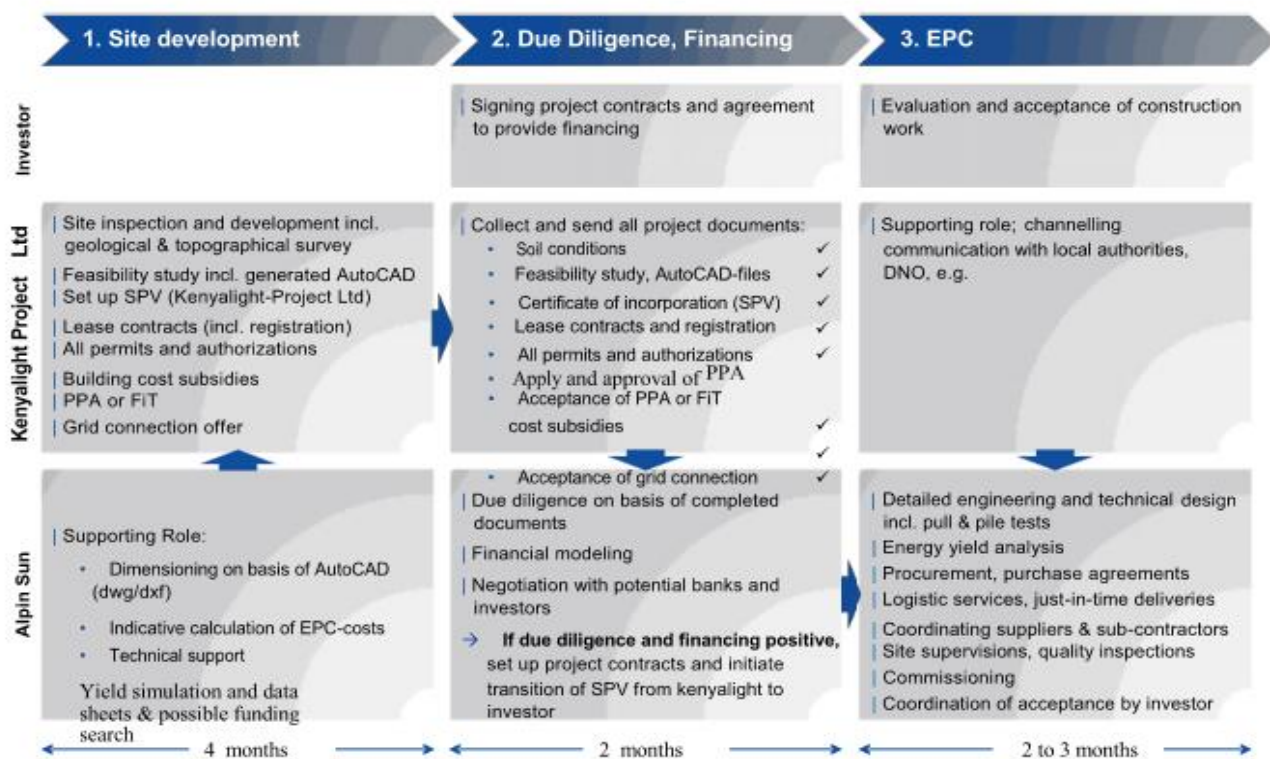
Maintenance

- All equipment comes with guaranteed manufacture Warrenties. Operation and Maintenance can be quoted for the duration of the initial stages of the project.

Project Plan

Below is an approximate Project Plan to outline the number of weeks each activity will need to be completed.

Distribution of responsibilities between Kenyalight Project Ltd & Alpin Sun GmbH on a project flow chart



Nakuru 25MW Solar Farm costs.

Pricing per 25MW Project

Design	\$600,000
Equipment	\$36,500,000
Construction	\$4,400,000
Total EPC Works	\$41,500,000

Permits, Surveys, Grid Connection, Company Set-up etc are not included within this amount.

We are willing to discuss this pricing depending on the commitment of the grid connection.

All Equipment for construction purposes is included within our quote, however Alpin Sun chooses to purchase, hire or other means, the equipment necessary for the project.

All work undertaken by third parties, except where it is clearly stated, will be covered.

Alpin Sun retain the right to sub contract out as much or as little of the EPC, Engineering, Procurement and Construction work.

Payment will be made in Installments	
Initial Payment	\$200,000
Equipment Payment	\$25,000,000
Construction Payment	\$12,000,000
Accreditation Payment	\$4,300,000
Total EPC Works	\$41,500,000

Alpin Sun GmbH
Kenyalight-Project Ltd

Nakuru 25MW Solar Farm EPC costs \$41.5 million

8. Performance of Grid-connected PV

PVGIS estimates of solar electricity generation

Location: 0°0'0" North, 36°0'0" East, Elevation: 1545 m a.s.l.,

Solar radiation database used: PVGIS-CMSAF

Nominal power of the PV system: 25000.0 kW (crystalline silicon)

Estimated losses due to temperature and low irradiance: 13.0% (using local ambient temperature)

Estimated loss due to angular reflectance effects: 2.6%

Other losses (cables, inverter etc.): 7.0%

Combined PV system losses: 21.2%

Fixed system: inclination=1°, orientation=180°				
Month	E_d	E_m	H_d	H_m
Jan	130000.00	4030000	6.66	206
Feb	137000.00	3820000	7.08	198
Mar	139000.00	4320000	7.23	224
Apr	120000.00	3600000	6.13	184
May	121000.00	3740000	6.09	189
Jun	121000.00	3620000	6.06	182
Jul	117000.00	3640000	5.91	183
Aug	123000.00	3810000	6.20	192
Sep	131000.00	3920000	6.66	200
Oct	121000.00	3760000	6.21	192
Nov	114000.00	3410000	5.78	173
Dec	122000.00	3770000	6.17	191
Yearly average	124000	3790000	6.34	193
Total for year		45400000		2320

E_d : Average daily electricity production from the given system (kWh)

E_m : Average monthly electricity production from the given system (kWh)

H_d : Average daily sum of global irradiation per square meter received by the modules of the given system (kWh/m²)

H_m : Average sum of global irradiation per square meter received by the modules of the given system (kWh/m²)

PVGIS © European Communities, 2001-2012

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9. Technical Detail – 25MW Solar Farm for Nakuru in Kenya (specific full design will be underway by ALPIN Sun GmbH following FIT agreement).



Project technical overview

Objective: PHOTOVOLTAIC POWER PLANT
Positioning: Groud mounted
Kenya

Designed electrical installation

Un = 0.4 kV / 23 kV
Installed Power (kW) : Pi = 26110 kW
Maximum Output Power: Pa = 25000 kW

Proposed configuration for the PV Plant consist in 104440 pieces photovoltaic panels of 250Wp placed on metal structures at an angle of **1 degree**, azimuth 0 ° (North). There will be used 4334 metal structures, with 24 PV panels each. The metal structures will be mounted with metal anchors in the ground. All panels will be connected in series of 24 panels.

To avoid self-shading of the panels during the year, a distance of 3,5 meters will be kept between the structures.

Technical details of PV panels:

- Power Pmpp: 250 Wp
- Type of cell: poly-crystalline 60 pcs / panel
- Open circuit voltage Uoc: 37.3 V
- Short circuit current Isc: 8.9 A
- VMP voltage: 30.3 V
- Impp current: 8.26 A
- Efficiency: 15.37 %
- Dimensions: 1640 mm x 992 x 50 mm
- The total area of the panel: 1.627 m²
- Maximum system voltage: 1,000 V
- Temperature coefficient:
 - Open circuit voltage: -0.33 %/ °C
 - Pmpp: -0.39 %/ °C
 - Isc: +0.033 %/ °C

To connect the photovoltaic panels between each other, special solar cables will be used with the dimension of 6 square millimeters (sqmm). The panels have incorporated solar cables of 4 sqmm with a length of 90 cm for each terminal but to complete the connection to the inverter it will require additional solar cable. Solar cables have a voltage of 1800 VDC and are resistant to UV radiation, high temperatures, adverse weather conditions, oil and other corrosive substances.

Commercial proposals

25MW Solar Farm – in Nakuru in Kenya



Technical and commercial proposal:

The Contractor undertakes itself or through its subcontractors to provide the Beneficiary with the following equipment and services as detailed below:	
Turn key power plant: Installed power DC: 26110 kwp; Output power AC: 25000 kwp;	
Equipment	Pieces
<ul style="list-style-type: none"> ❖ Photovoltaic panels: Polycrystalline 250 Wp 60 cells, certified and tested, 25 years linear production guarantee. Tier 1 manufacturers: Risen Energy, Jinko, Yngli, Trina, Cecep depending on current stock availability and preference of the investor. ❖ Inverters: string inverters 27,6 KV ABB Trio 27,6 TL or German made Refusol 27.6 KWp ❖ Transformers: ABB 2000 KV ❖ AC / DC cables: German made 15 years warranty HIS Renewables / Prysmian ❖ Support structure: galvanized steel – according with resistance technical project provided by the buyer with 	<p>104.440 pcs</p> <p>865 pcs;</p> <p>14 pcs;</p> <p>ml;</p> <p>ml / kg;</p> <p>ml/ kg;</p>
<ul style="list-style-type: none"> minimal 15 years warranty; ❖ Fences and gates: galvanized steel according with the technical/ architecture project; ❖ Security system: CCTV; ❖ LED Perimeter lighting; ❖ Medium voltage cable- in site; ❖ Auxiliary equipment; ❖ Data logger and meteo station; ❖ Production monitoring system – web 	

based application; ❖ Technical project of the plant;	
Free Spare parts offered as a discount for this site only (to be left on the client custody): ❖ Photovoltaic panels: 200 pcs; ❖ Inverters: 20 pcs; ❖ Cables, boxes, connectors, fuses;	
Carried works: ❖ Equipment supply on site; ❖ Material supply on site; ❖ Structure ramming; ❖ Structure mounting; ❖ Panels installation; ❖ Invertors installation; ❖ DC/ AC cables installation; ❖ Cables trenches, roads and other civil works; ❖ Transformers installation; ❖ Fences and gates installation; ❖ Perimeter lightning installation; ❖ Security system installation; ❖ Medium voltage installation – inside of the plant; ❖ Grid connection operations (jointly with grid operator); ❖ Testing;	
❖ Commissioning and putting in operation;	
Workforce: ❖ 6-12 Ramming machines; ❖ 5 Lifting equipment; ❖ 3 Backhoe loaders; ❖ 2 Digging machines; ❖ 100 Electric and hand tools; ❖ Up to 200 peoples: engineers, site managers, installers, electricians, construction workers;	

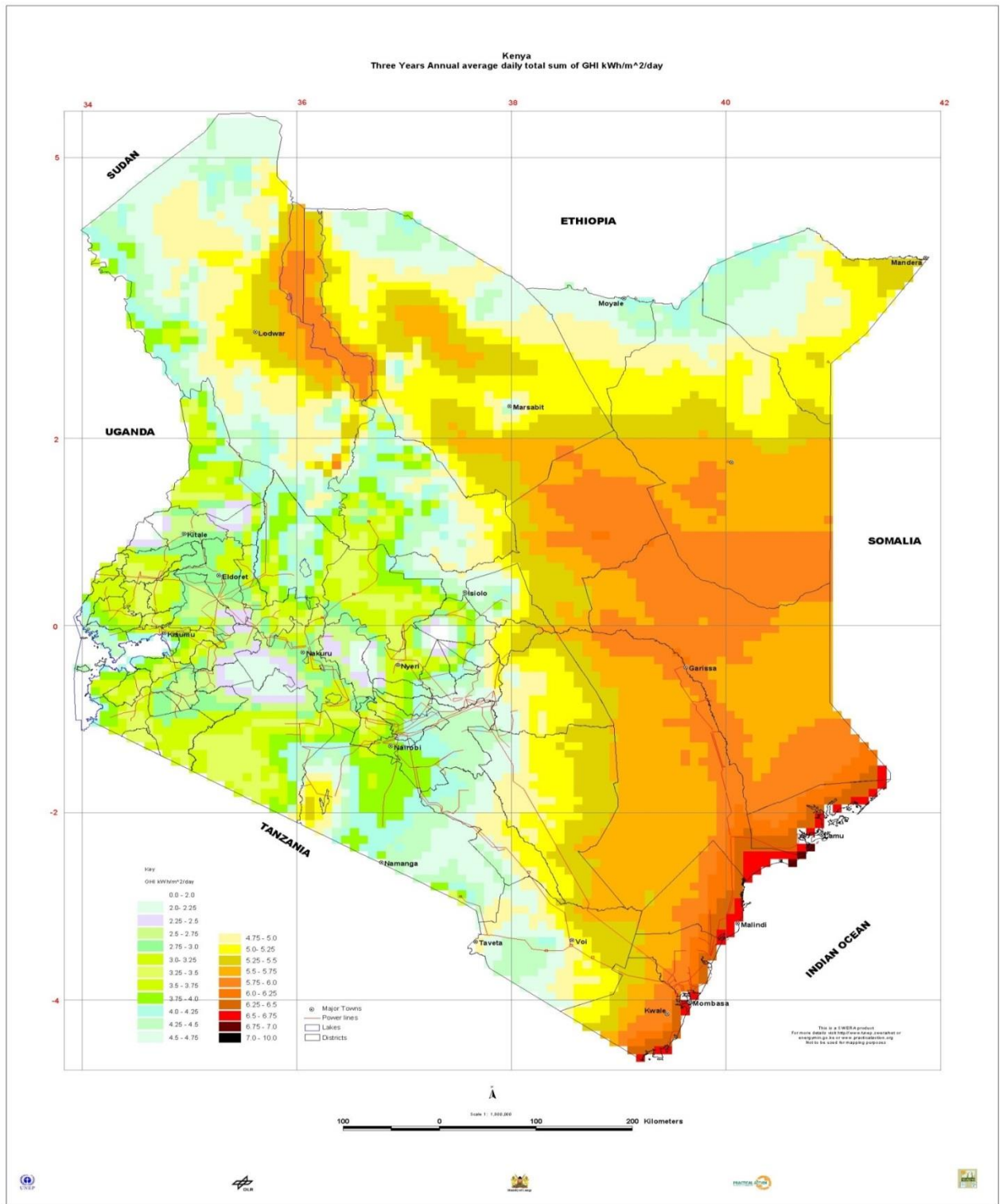
Guarantees:

- ❖ System integrator – overall power plant EPC guarantee: 2 years standard or 5 years (with O&M contract);
- ❖ Photovoltaic panels: 25 years linear production guarantee;
- ❖ Inverters: 10 years guarantee;
- ❖ Transformers: 2 years guarantee with extended program offered by ABB;
- ❖ Steel structure guarantee: 15 years against corrosion;

Insurances:

- ❖ Construction All Risk Insurance 20 mil USD;
- ❖ Construction Bond/ Surety Bond according with Kenyan regulations;
- ❖ ALOP (advance loss of profit insurance) covering potential delays of minimum 1 mil USD;
- ❖ Third Liability Insurance: 3 mil USD;
- ❖ Legal Liabilities according with Kenyan laws;
- ❖ O&M provider liability;
- ❖ Operational All Risk Insurance – *optional with O&M*;

10. Solar Radiation Map



11. ENVIRONMENTAL AND SOCIAL PARAMETERS

The environmental impact and its social impact implications will be put into consideration during the development of this project.

The Initial Environmental Impact Assessment will be done in order to determine whether the proposed project will have adverse or mild effects on the environment and to tell whether to carry out a full Environmental Impact Assessment or a full Environmental Impact Study.

Either of the two will be accompanied by a Comprehensive Mitigation Plan which describes the arrangements for implementing mitigation measures to reduce the ‘would be’ impacts on the surrounding environment.

The following template represents the “proto type” case study of the Environmental Impact Assessment that will follow after the investor is granted an Expression of Interest Permit by the Ministry of Energy;

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12. FINANCIAL AND ECONOMIC PARAMETERS OF THE PROJECT (PRELIMINARY COST-BENEFIT ANALYSIS).

The fundamental question of whether Solar photovoltaic (PV) makes economic sense as a power resource can be addressed with a basic economic benefit-cost (B/C) analysis, in which the levelled cost of electricity produced with a PV system is compared to the levelled value of its output.

In addition, the nature and magnitude of subsidies, impact of the solar power production on electric rates, and the degree of cost shifting among utility customers are also important factors to consider.

There are numerous ways to think about economic benefits of a given project, but one common approach is to derive a Benefit/Cost ratio with the net present value (NPV) of project benefits in the numerator and the NPV of project costs in the denominator.

$$\text{B/C Ratio} = \frac{\text{Net present value of project benefits}}{\text{Net present value of project costs}}$$

B/C ratio > 1 means the project is economic, as benefits exceed costs.

B/C ratio < 1 means the project is uneconomic, as costs exceed benefits.

The relative cost-effectiveness of projects can be assessed by comparing their benefit-cost ratios; the higher the B/C ratio, the greater the economic value of the project and therefore the more viable the project is.

However, it is important to note that there is no any single, standard cost-benefit modelling approach that is accepted by all as a blue print. The results and conclusions might be different depending on how the analysis is conducted. For that reason, this pre-feasibility study considered at least three key case scenarios of the modelling that will crucially affect the results:

- (i) The perspective of the solar power customers in gauging the costs and benefits of the project
- (ii) The perspective of the non-solar power customers in gauging the costs and benefits of the project
- (iii) The perspective of the general society in gauging the costs and benefits of the project

In principle, all the three groups of people examined the project in terms of the advantages and the disadvantages it is going to have on them (“affected people”) per se. In this respect, now that the installation will not be a stand-alone project but it will rather be fed to the national grid, all the 3 groups mentioned above are affected.

The benefit-cost assessment can differ across the stakeholder groups because the specific terms included in the respective benefit-cost equations vary across the groups. As discussed below, there are a number of reasons for this, but one factor is the presence of subsidies.

Many solar projects benefit from various types of “societal” subsidies from the governments of those particular countries. In that line, Kenya is one of the 60 countries who are committed to promote the usage of renewable energy such as solar and wind power in terms of tax reliefs and other forms of government subsidies. This shows that subsidies exist for solar PV, and they might affect the B/C ratio in a positive way for this particular proposed project.

The projected project EPC cost is estimated at 41 Million USD and total build costs at 48.2 million USD and it will be completed within a maximum of 24 months and to live for at least 25 years before any other major installation such as replacement of solar panels and other infrastructure to be made. The overhead infrastructure (power lines) will be constructed over a distance of about 1km from the project site.

Considering this proposed project as a hypothetical power project with an initial one year peak load of 25 MW and sales of 0.12 USD per KWh.

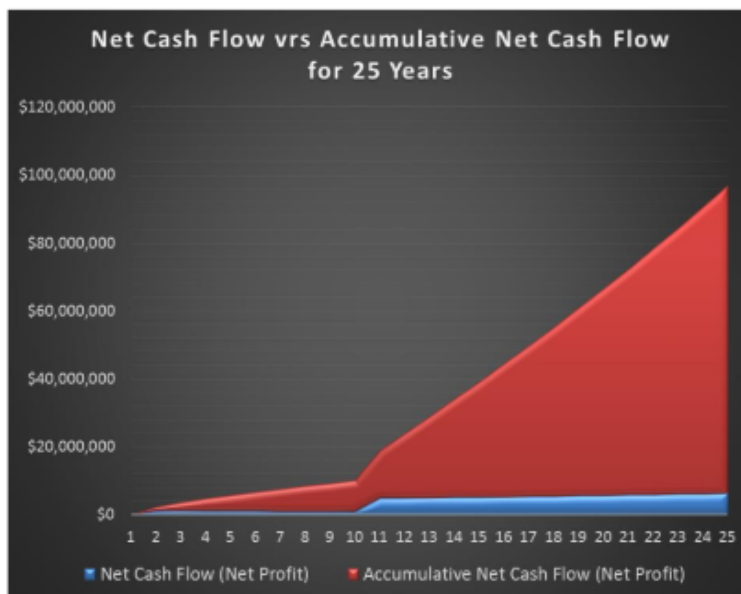
However, the benefits of this project supersede its costs and therefore it is economically viable and therefore recommended for approval. For instance, it will earn a lot of revenue to the investors and also to the government in form of taxes. It will also benefit the local communities in form of corporate social responsibilities projects by the power company. These benefits are illustrated in the concept paper documents attached to this report as indexes.

Stage One - Pre - Build Stage Finance - \$268,355 or KSH 25,000,000

No.	Description	Cost(KSH)	
1	Land Arrangements		
	Site Cadastral survey	100,000	
	Topographical survey	1,800,000	
	Valuation of leased land	200,000	
	Community Engagement	250,000	
	Leasing Agency/ Negotiations	100,000	
	Lease Registration	50,000	
	Lease payments	50,000	
	Aerial Site Maps/ Photography	250,000	
	Legal Fees		
	Lease Arrangements		
	Legal Review	50,000	
	2	Consultancy	KES 20,000
		Prefeasibility Study /EOI	
	Feasibility Study	150000	
	Project development advisory	250000	
		250,000	
	Legal Fees		
	Lease Arrangements		
	Legal Review	50,000	
2	Consultancy	KES 20,000	
	Prefeasibility Study /EOI		
	Feasibility Study	150000	
	Project development advisory	250000	
		250,000	
3	Engineering/ Design		
	Conceptual Engineering/ Design		
	Preliminary KPLC Grid Lad Analysis	5,000,000	
	Electrical connection Study	250,000	
	Resource Assessment	2,000,000	
	Financial Analysis	2,000,000	
		200,000	
4	Regulatory /Compliance Assessments		
	Initial EIA		
	Full EIA	400000	
	EIA Governemnt Fee	1000000	
	PPA Negotiation	KES 4,100,000	
	ERC Survey of Regulations	KES 500,000	
	County Authority Building and Permit/ Planning Zone Regs	KES 100,000	
	Community Sensitization	KES 200,000	
5	Change of User	KES 250,000	
6	Management/ Admin/ Logistical Cost	200000	
	Sub Total		
	Contingencies		
	TOTALS		
		KES 1,860,000	
		KES 25,000,000	

Financial Analysis - 25MW Solar Farms in Nakuru – Kenya

PROJECT AT A GLANCE	
Return on Investment (ROI) %	7.54%
Internal Rate of Return (IRR) %	3.94%
Net Present Value (NPV) \$	\$91,520,113
Averaged Yearly Net Profit	\$3,632,979
Payback in Years Based on EBITD	7.23
Loan Amount \$	\$31,200,000
Deposit Amount \$	\$17,000,000
Loan Repayment in Years	10.00
Interest Rate on Loan	5.00%



Project can be funding via 100% Debt funding or Debt:Equity so in the above case \$31.2 m : \$17 m

1st Year Break Even Analysis			
Solar Plant Output %	Power Produced kW/y	Power Sales USD	Fixed Costs USD
100%	46,950,000	\$5,634,000	\$5,607,665
95%	44,602,500	\$5,352,300	\$5,607,665
90%	42,255,000	\$5,070,600	\$5,607,665
85%	39,907,500	\$4,788,900	\$5,607,665
80%	37,560,000	\$4,507,200	\$5,607,665
75%	35,212,500	\$4,225,500	\$5,607,665
70%	32,865,000	\$3,943,800	\$5,607,665
65%	30,517,500	\$3,662,100	\$5,607,665
60%	28,170,000	\$3,380,400	\$5,607,665
55%	25,822,500	\$3,098,700	\$5,607,665
50%	23,475,000	\$2,817,000	\$5,607,665
45%	21,127,500	\$2,535,300	\$5,607,665
40%	18,780,000	\$2,253,600	\$5,607,665
35%	16,432,500	\$1,971,900	\$5,607,665
30%	14,085,000	\$1,690,200	\$5,607,665
25%	11,737,500	\$1,408,500	\$5,607,665
20%	9,390,000	\$1,126,800	\$5,607,665
15%	7,042,500	\$845,100	\$5,607,665
10%	4,695,000	\$563,400	\$5,607,665
5%	2,347,500	\$281,700	\$5,607,665
0%	0	\$0	\$5,607,665

1st Year Break Even Analysis		
Power Produced Required kW/y	Minimum Solar Plant Output	Break Even Target Sales USD
46,730,541	99.53%	\$5,607,665
Variables Used		
100% Solar Plant Output kW/y	Power Price (USD per kW/h) - refer	Fixed Costs USD
46,950,000	0.12	\$5,607,665

Alpin Sun GmbH
 Zum Wasserwerk 12
 D-15537 Erkner (bei Berlin)

The Managing Director,
 Kenyalight-Project Ltd
 Joe Mwai, Mwai House,
 46 Biashara Street, Limuru
 Kenya, PO Box, 146

26/01/2015

**LETTER OF INTENT FOR THE NAKURU 25MW
 SOLAR FARM PROJECT, KENYA**

Dear Mr Joseph Mwai and Mr Alan Brewer,

We hereby express our interest to work together with the two 25MW projects named Mai-Mahiu 25MW and Limuru 25MW. Projects in the Kenyalight Project portfolio.

Our company, Alpin SUN GmbH has cash funds in HVB HypoVereinsBank Berlin AG.

We are interested in a partnership for the EPC work of the 25MW project in Kenya, under Kenyalight-Project Ltd. Alpin Sun, hereby, expresses their intent to work alongside the above company to develop this project in Kenya.

We propose to undertake the EPC work of the projects and can offer all technical support, drawings, calculations for grid connections and further understanding of the electrical and technical aspects of the design. These will all be charged, along with construction, we can also offer the construction work and will hold full rights to undertake all aspects of construction. This work can then be sub-contracted to local companies and workers as Alpin Sun feels is worthwhile for the project. Alpin Sun can also offer considerable project planning, business accumen and consulting.

We require Kenyalight-Project to have the following list regarding their projects:

- A secured company and SPV.
- A Lease Agreement with the landowner.
- The Grid Connection quotation.
- The agreed PPA for each project guarenteed.

Surveys and permits to enable the construction of the project and all other necessary work

All funding related to the projects will be dealt with per project. Funding can be gained from a variety of sources. Alpin Sun hereby, shows interest in these 25MW projects and intent to put funders forward for the project at the time when the project is in a position to be built or with substancial equity within the project. The funders will be given all information, including grid connections, design layout and proposed projections, along with the PPA and FiT to make full evaluation of the project and the terms of their commitment to Kenyalight-Project Ltd directly and to the project through the government secured PPA and Feed-in-Tariff. Alpin Sun will offer to buy out the rights to any project at any given time.

Alpin Sun, by signing this agreement, hold the rights to be of first refusal, the EPC work for the 25MW project and with the above company. As way of a proof of intent and purpose, Alpin Sun will offer free of charge, an initial project design land and panel layout for the 25MW projects.

Alpin Sun GmbH

Kenyalight-Project Ltd



Adrian Ioance
 Head of Overseas Departments



Mr Joseph Mwai
 Managing Director



Mr Alan Brewer
 Director

13. OPTIONS

There were four options which were explored during this feasibility study;

6.1[Option 1] Do Nothing

The ‘do nothing’ option was examined but it was found to have a lot of disadvantages.

There are a lot of costs involved with not proceeding with the project. These costs include the following;

- (a) The country will miss the opportunity to add 25MW of power to its national grid. This will lead to less energy and less productivity and reduced pace towards industrialization.
- (b) The would be local contractors and laborers will not get the chance to earn a livelihood.
- (c) The potential investor from local and international market will miss an investment opportunity. This will make them to lose interest in investing in the country, thus lowering the economic productivity of Kenya as a country.
- (d) The land is currently lying idle under very minimal subsistence farming. Taking this option will deny the owner of the land an opportunity to maximize the productivity of his farm.

6.2 [Option 2] Constructing a Hydroelectricity Generation Plant

6.2.1 Technical and Financial Feasibility

This option was examined but was found to be technically not feasible. This is because there is no major river that can have the capacity to generate electric power in the region. In addition, the costs to look for another region and to build the infrastructure from the plant to the national grid superseded the resources of the investor. It would also depend on the availability of land which is also not readily available.

6.3 [Option 3] Constructing a Wind power Generation Plant

6.3.1 Technical and Financial Feasibility

This option was examined but was found to be technically not feasible. This is because there are no strong winds which have the capacity to generate electric power in the region. In addition, the costs to look for another region and to build the infrastructure from the plant to the national grid superseded the resources of the investor. It would also depend on the availability of land which is also not readily available.

6.4 [Option 4] Constructing a Solar Power Generation Plant

6.4.1 Technical and Financial Feasibility

This option was examined and it was found to be the most technically feasible option. This is because there are strong solar radiation levels which have the capacity to generate sufficient electric power in the region. This is indicated in a separate document attached to this report as indexes.

It is also the most feasible in terms of cost as mentioned in the preliminary cost-benefit Analysis above. A detailed project cost and benefit report is attached to this report as an index.

6.5 Comparison of Options

Four options namely the 'Do Nothing', Hydro-power, Wind-power and Solar-power projects were compared.

Out of the four, the solar power appeared to be the most feasible option. This is a result of the type of natural resource found in the region which is the pre-determiner and also the financial feasibility in terms of the cost involved and the output realised from the investment.

14. RISKS AND BARRIERS TO THE PROJECT

The development of renewable energy systems is a capital-intensive process that most developing countries cannot undertake without financial support from development partners. However, there are some rampant investment risks which are the key barriers to investors in developing countries like Kenya.

The investment risks include political instability, low-carbon policy and currency value fluctuation, monopolization of energy production, transmission and distribution, as well as community non-involvement. Based on the identified risks, the study recommends the need for the Government to secure a sustainable political stability, strengthen laws and policies promoting foreign investment, establish currency-strengthening mechanism, open-up renewable energy market and promote community involvement.

The developer has sourced a partnership agreement with an international investor who has committed himself to fund the project and has written a letter of intent to fund the same. That letter has been attached to this report as one of the appendices.

ANNEXES

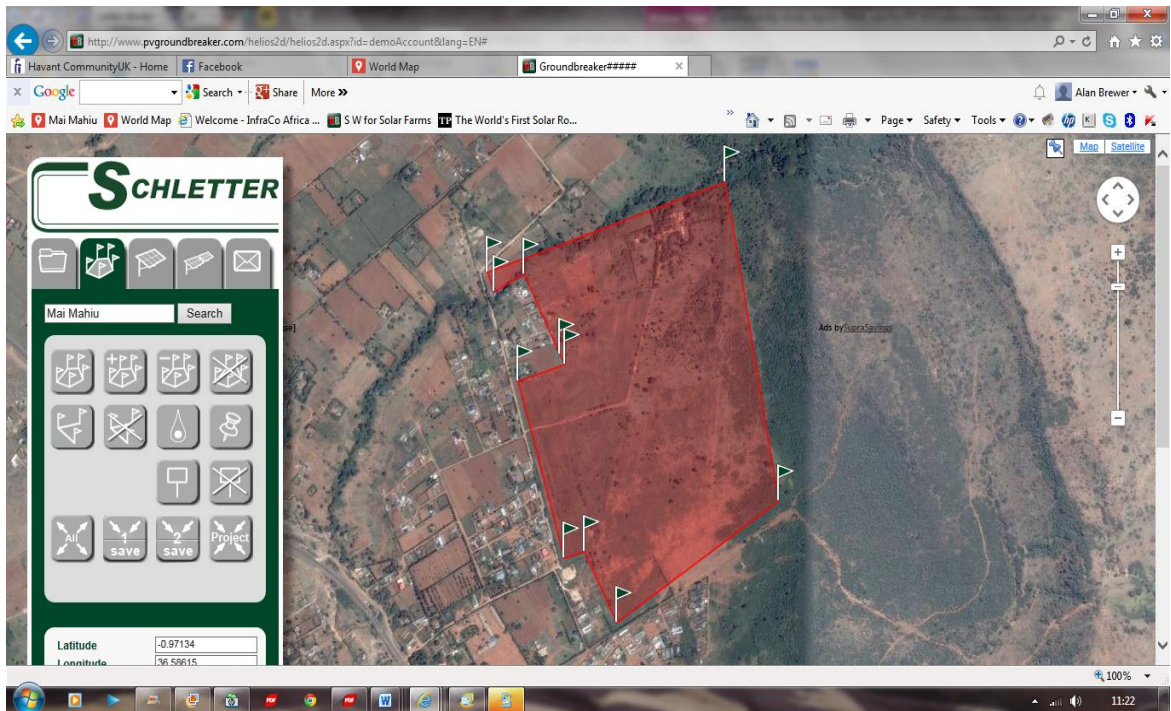
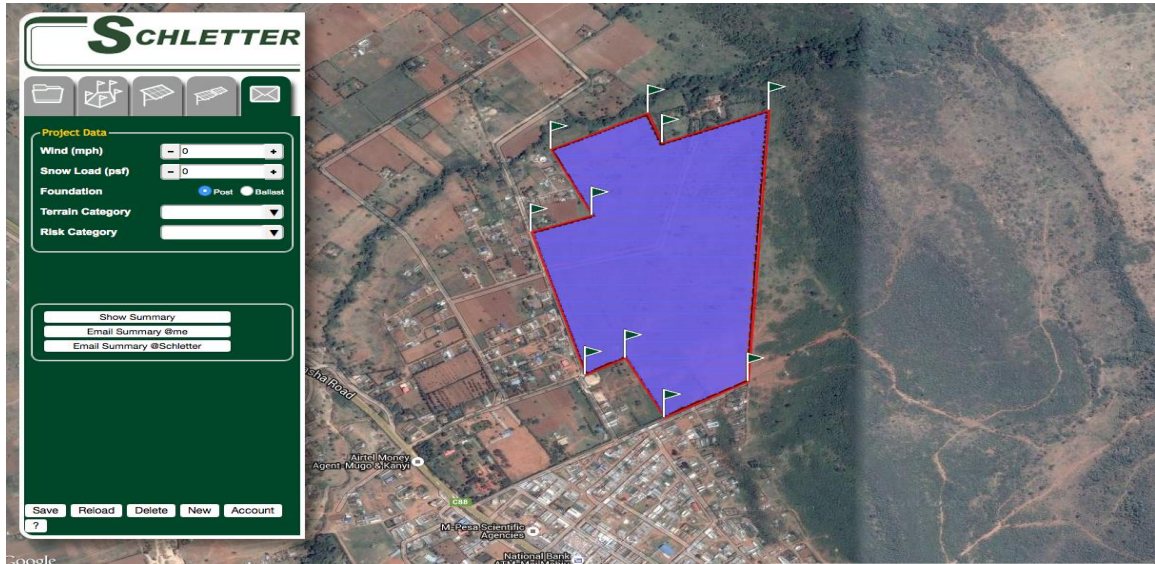
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Technical Aspect drawings - information about the said 25MW solar project



25MW Solar Farm site at Nakuru

25 MW Solar Farm in Nakuru – process in design.



http://www.pvgroundbreaker.com/helios2d/helios2d.aspx?id=demoAccount&lang=EN#

Groundbreaker####

Google Imagery ©2015

SCHLETTER

Rack Definition

Rack Name: []

Rows: -1 +

Columns: -1 +

Orientation: Landscape Portrait

Save Rack

Module

Manufacturer: []

Module select: []

Length (mm): 0

Width (mm): 0

Power (W): 0

Save Module

100%

11:45

http://www.pvgroundbreaker.com/helios2d/helios2d.aspx?id=demoAccount&lang=EN#

Groundbreaker####

Google

Parameters

Field Offset (m): -5

Tilt Angle (°): -10

Reference Date: 12/21/2015

Reference Time: 12:00

South East-West

Row Distance

Distance (m): -10.242

Gap Rise to Base

Fill Area Delete Pl.

Information

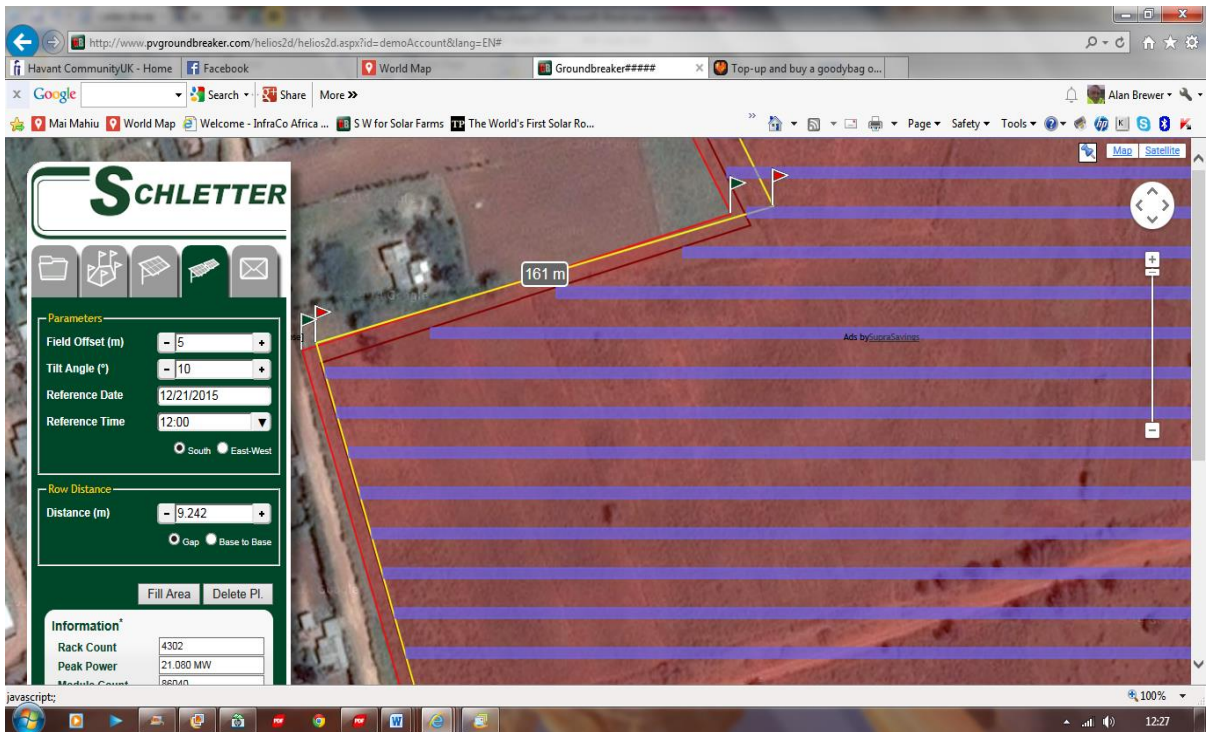
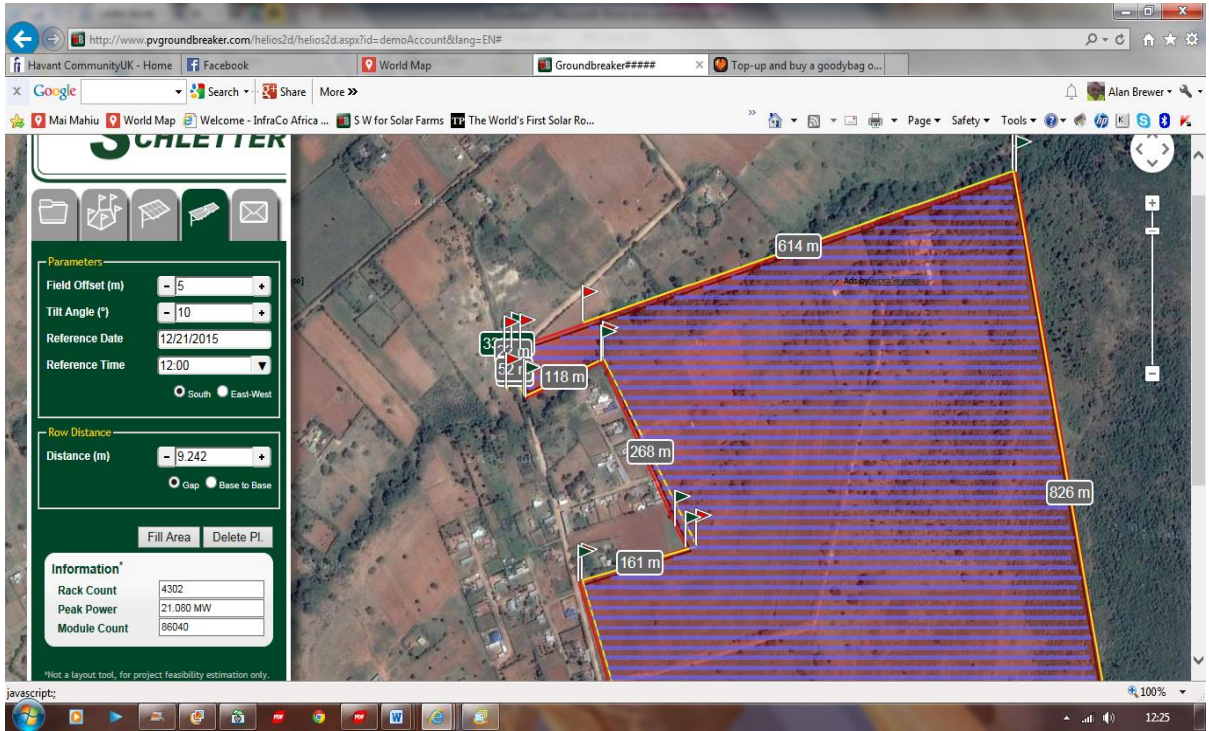
Rack Count	3984
Peak Power	19.522 MW
Module Count	79680

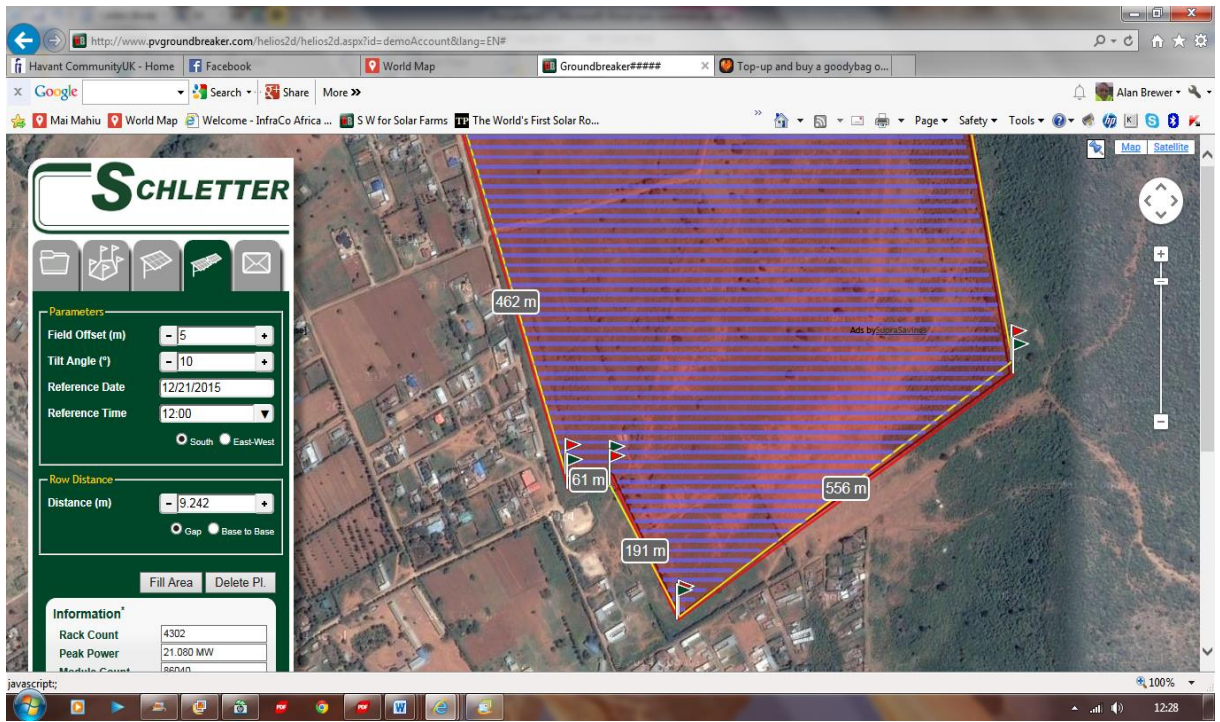
*Not a layout tool, for project feasibility estimation only. Does not account for inverter and row spacing or thermal expansion.

Save Reload Delete New Account ?

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Company Profile



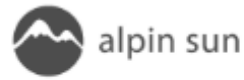


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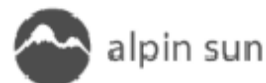
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Adrian Ioance

Managing Director, Head of Overseas Departments

Business Plan

A. Executive Summary

Group General Overview

Alpin Sun brings together a group of Romanian- German societies, specialized in photovoltaic power plants. The foundations were laid in 2005 when Sun Farming was set up in Germany. It's a company whose activities are focused towards achieving their investment in photovoltaic plants in Germany. Sun Farming currently holds a portfolio of 40 MW, being a respected producer of renewable energy in Germany. By following the European trend of expanding the interest in renewable energy in Europe, in 2008, an international construction division broke away from the Sun Farming Company, becoming a stand-alone business, known today as the Alpine Sun GmbH.

Alpin Sun has experienced a great evolution in recent years, by following several stages of development, starting by assembling plants and, later, encompassing the design and supplying of equipment, which is called the EPC. The next step towards the ascension of Alpin Sun activity was embedding project development activities and, later, the operation and maintenance of photovoltaic parks. Since its debut and up to now, Alpin Sun has completed more than 180 photovoltaic plants in Italy, Belgium, Germany and Romania. The most representative projects are conducted between 2012-2014 in Romania, totaling 34 MW, being utility scale projects with installed capacity between 1.5 MW to 7 MW.

During this period, Alpin Sun has been very active on the development side, making up to now, more than 15 fully licensed projects, and totaling over 70 MW installed capacity. Some of these projects were sold to investors, along with EPC contracts, which constitute a part of the working basis of the company and a good source of cash. In order to streamline the operations, the Romanian society, Alpine Solar SA, was founded, taking over the Engineering and Construction activity, with over 100 employees in Romania, while the German Society still remains responsible for Procurement and international contracts. Regarding its own developed projects, they are carried out through project companies (SPV), according to the Romanian legislation, regulations related to the establishment and operation of electricity producers and specific commercial usage.

At the moment, 15 companies are integrated in the group project, 7 of them being part of the investment described in this documentation. Finally, Alpin Sun deals with energy production, the group owning two photovoltaic plants with an aggregate installed capacity of 5 MW, which are located in Codlea, Brasov County and Reci, Covasna county. In 2013, Alpin Sun projects amounted 40 million EUR and the net result was about 5 million EUR at the end of the year. The group strategy aims to strengthen the energy producer's position in Romania, by achieving and international expansion in: Asia (China and India), South America (especially Chile), MENA (Arab countries, Morocco, Tunisia), Eastern Europe (Albania, Macedonia, Serbia). The business model adopted in each country will be the same as the one successfully applied in Romania, following two directions: EPC contractor and investments. That's why, partnerships were established and in China, for example, it was set up a branch and a project company responsible for making a 50MW plants in Inner Mongolia"

The current generation has the unique opportunity - and the obligation - to position our energy system on sustainable pillars. Leaving a clean environment to our children and grandchildren is our duty. This cannot be followed without coming to renewable energies. The employees and shareholders of Alpin Sun feel an obligation to observe this responsibility. With every newly - installed photovoltaic plant we come a small step closer to the goal of renewable energies as the key source of energy supply. We are convinced that every photovoltaic plant that currently delivers electricity to the grid is the independent energy supply for its immediate vicinity in the future. In order to optimize the use of solar electricity via the consumer we are positioning our plants near by potential end user.

At Alpin Sun, we work to make the world a better place to live, encouraging collaboration, innovations sharing, responsible use of resources and growing sustainable business to be legacy for our children. We are committed to our goal to built a photovoltaic plant is every place of the world where is needed a breath of fresh air.

B. Portfolio

We are always expanding our portfolio to move with the direction of the market. We have established a healthy growth across Europe with the portfolio pictured below and also developin into the UK recently. We have also expanded worldwide into Turkey with a 4MW project and a 50MW project, into Chile with three large projects of 70MW, 30MW and 30MW. We are also expanding into various parts of Africa.



Harman Clue, Brasov, RO
7,314 MW



Harman Setra, Brasov, RO
6,4 MW



Jichisu de Jos, Cluj, RO
6,4 MW



Jichisu de Jos, Cluj, RO
5,8 MW



Belgium
3 MW



Codlea, Brasov, RO
3 MW



Ghindari, Mures, RO
2,5 MW



Nazna, Mures, RO
2,5 MW



Unterempfenbach, Mai...
2.2 MW



Oberempfenbach, Main...
2,2 MW



Reci, Covasna, RO
2,133 MW



Mizil, Buzau, RO
1,9 MW



Reghin, Mures, RO
1,5 MW



Bottrop 2, DE
1,5 MW



Ergolding, Munchen, DE
1,420 MW



Eschelbach, Mainburg, DE
1,4 MW



Bottrop, DE
1,3 MW



Rostock, DE
1 MW



Bottrop + Langenfeld, DE
1 MW



Langenfeld, DE
800 KW



Rotem, BE
500 KW



Opglabeeek, BE
500 KW



Kinrooi, BE
300 KW

C. Group structure:

Since, Alpine Sun activates on several markets and provides distinct products and services, group activities are divided into individual companies to reduce risk exposure and to be managed properly according to them on going operations.

All groups share the common shareholders and have a performing management under the careful guidance of the board of directors.

Sun Farming GmbH	Alpin Sun GmbH	Alpin Solar SA	Alpin Sun China	Electricity Production - Operational PV	SPV's ongoing PV Projects
- Electricity Production in Germany	- EPC Contractor - responsible for procurement and international contracts / wholesale equipments for photovoltaic power plants	- Project Development - EPC Contractor - engineering and construction - O&M provider	- EPC Contractor - Energy producer - Project Development	- 2MW Power Plant, Suninvest ROPV1, Reci, Covasna County, Romania - 3MW Power Plant, Energy Fond Roest, Codlea, Brasov County	- Energy Fund Bravo LLC - Energy Fund Aliseo LLC - Energy Fund Lano LLC - Energy Fund Suninvest LLC - Nea Solar LLC - Ever Solar LLC - Go East Solar LLC

Products and services

Alpin Sun as a vertically integrated renewable energy group covers whole project phases starting with "green" idea and finishing with energy supply to end user.



Over the years Alpin Sun has established a comprehensive range of competences and experience in PV power plants. The most important element of our quality approach is related to the quality of the work as the result of the systematic application of established principles. In this respect, we refer to the Alpin Sun quality system applied to all our business division.

Project development	EPC	O&M
<ul style="list-style-type: none"> - Location identification - Purchase of real construction rights - Design Feasibility - Business planning - Permits and approvals - Project management 	<ul style="list-style-type: none"> - Technical projects for construction and grid connection - Procurement of materials and equipments - Construction of access and electrical infrastructure - Ramming of steel structure - Mounting structure, panels, cables - Mounting inverters and transformers - Mounting AC/ DC - Cables - Grid connection 	<ul style="list-style-type: none"> - Maintenance - Monitoring and technical assistance - Legal and administrative - Facility Management - Commercial - Management of the plant - Risk management

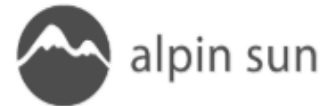
Trading	Electricity Production - Operational	Energy Production - Projects
<ul style="list-style-type: none"> - Energy trading - Green certificates trading - Invoices and payments - Financial overview - Monthly statements - Tax calculation 	<ul style="list-style-type: none"> - 2MW Power Plant, Suninvest ROPV1, Reci, Covasna County, Romania, 2400 MWh annual production - 3MW Power Plant, Energy Fond Roest, Codlea, Brasov County, 3600 MWh annual production 	<ul style="list-style-type: none"> - 2 MW Energy Fund Bravo - 3 MW Energy Fund Aliseo - 3 MW Nea Solar - 9 MW Go East Solar - 23 MW Suninvest RO PV1 - 9 MW Ever Solar

Customers

Alpin Sun as a comprehensive photovoltaic projects solution provider, we aim to satisfy our client needs overall or through our individual business divisions.

- **As project developer** – we focused on local markets energy demands corroborated with future perspectives and international trends and train a highly skilled development team which was able to deliver ready to built bankable projects. Through project development division we open the local utility scales market for international investors. Quality of Alpin Sun projects is proved by our client statements and not less important by the positive due diligence reports conducted by Wolf Thies, an important European law firm. Although energy market and specific legislation are difficult, hard to tackle, constant changes being a real challenge, all our projects are updated and fully licensed. No regulatory or legal items left unsolved.
 - **In 2013, projects rights for 13,5 MW was purchased by Unisun Energy LLC Hong Kong, for EUR 2,5 millions.**
- **As EPC contractor** – join forces of Alpin Sun and Alpin Solar team, manage to deliver 34 MW turn key power plants, just in 2013, handling investments of over EUR 40 millions. Businessmen, industrialists or financial investor have chosen to work with us due to innovation, performance, low risk and high quality, attributes found in each plant that we build.
 - **BaySolar AG** – an leading European photovoltaic company assigned Alpin Sun to built the 6.4 MW from Cluj County at the end of 2012. Plant was successfully commissioned and nowadays supplies green energy to Transilvanian grid.
 - **IRUM S.A.** – a 50 years old tractors manufacturer has decided to accomplish their energy needs from green resources and appointed Alpin Sun to build the 1.5 MW PV plant near by Reghin factory.
 - **Capidava Prodcum** – for this agribusiness Romanian player we built 2,5 MW power plant inside their farm located in Mures County.
 - **Zhejiang New Energy Investment Co** – for this Chinese leading industrial group we built two large scale 13.5 MW power plants in Brasov County, central Romania.More about our portfolio could be found below at references.
- **As O&M provider** - Alpin Sun Operation and Management 360⁰ solution has an comprehensive approach covering a full range of services: maintenance, monitoring and technical assistance, legal and administrative, commercial, facility management, risk management. For the moment Alpin Sun is in charge with a daily operation of 25 MW power plants:
 - **Setra Energy 6,3 MW/ Clue Solar 7,2 MW/ Solarfun 2,5 MW/ Topram 1.5 MW/ Capidava 2,5 MW/ Suninvest 2 MW/ E.F. Roest 3 MW/ Irum 1,5 MW.**
- **Energy and GC Trading** – marketing electricity and incentives through centralized or bilateral market is a difficult job to be handled by an unskilled energy producer, that's why we take care of that together with our commercial partners. Closing the circle assure our partners receive proper benefits from their investments.
- **Electricity producer** – by far the most satisfying of our activities is the production of electricity. Being part of this select group of renewable producers is a pride and also a duty having the responsibility of continuing the mission of growing sustainable businesses. Our energy is taken off by first class energy take offers and it is delivered directly to middle and large scale industrials.

- **Electromagnetica SA** - an 80 years old electrical components Romanian manufacturer, being one of the most successful examples of privatization after 1989 political regime changing. Today Electromagnetica is one of the largest LED lightning solution manufacturer from South East Europe, having around 800 employees and multiple production facilities in Bucharest. Electromagnetica has a diversified business portfolio, besides their industrial activity, are involved in real estate owning an impressive business and industrial park, is a key energy producers through its multiple hydro facilities and is the oldest energy trader on the market with more than 15 year of experience. As energy supplier they deliver to more that 150 industrials and commercial middle and large scale consumers.
- **Electrica Trasilvania Sud SA** – is one of the five Romanian grid operators being responsible for electricity supply to cities from central area of the country. Over the years we build a very strong

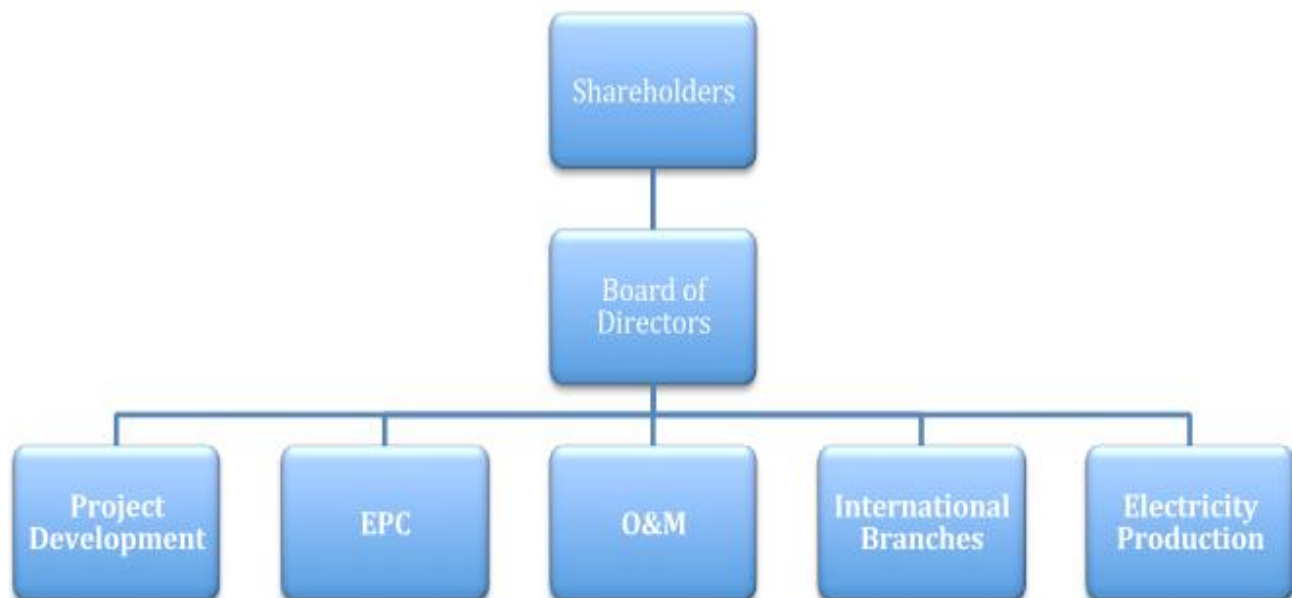


relation with this multi million energy giant.

- **Bepco SA** – this private own company is the main electricity supplier for Tektron, Brasov centralized heating company. As they serve a city with more than 200,000 inhabitants their main source is coal and natural gas, our green electricity is very welcome.

D. Organization and Management

Organizational chart



Alpin Sun organizational structure is simple and efficient, based on a reduce hierarchy and participative management.

Management is conducted by the board, a highly qualified and comprehensive management tool. Having an activity quite extensive, management decisions can not be taken effectively by one person, which is why leadership is a shared responsibility of board members. Board members come from different areas of activity which brings to the table a diversified expertise and making decisions can be made based on complex and comprehensive analysis.

Besides their role in the board, each member has specific responsibilities in the organization, being in charge with operations according qualification, experience and native skills.



Ownership and control

Ownership and control of Alpin Sun group it is same innovative as the management.

Although the major shareholder is Mr. Micu Bogdan Marian, the group is controlled ventures with employees on common share basis. Benefits and results following group activity are shared with employees, which lead to a join interest and common participation.

Basically, at the end of the day each employee has a share from the company, according with their role and value added to the group.



Board of Directors

Mr. Bogdan Micu, CEO

Founder and CEO of Alpin Sun, Mr. Micu is a prolific Romanian entrepreneur with many years business experience in real estate, IT, business consultancy and renewable energy. In 2006, Mr. Micu, founded and managed Bart & Micu Development, a very successful real estate company which provided services to multinational companies. Also, they made on of the first urbanization project from Brasov, building Lempes Residence, housing project with more than 100 units. In parallel Mr. Micu set up Rosoftlab an software development company. As main achievements Rosoftlab developed programs for Facebook and IOS. Mr. Micu is a visionary committed to the goal to make the world a better place to live. Joining forces with Sun Farming helped Mr. Micu to get in touch with renewable energy which proved to be a very suitable direction for him. In recent years Mr. Micu increase Apin Sun group activities to a multimillion business. Currently Mr. Micu holds shares in more than 20 companies directly related with photovoltaic energy. Besides green energy, Mr. Micu is very active in IT being the sponsor of research and development “on demand” software and in ECO Tourism. Mr. Micu holds an electronic engineering degree and followed several postgraduate courses in business management. Mr. Micu assures the overall management of the group and is directly involved in development, sales, project finance, international markets and research & development.

Mr. Adrian Ioance, Deputy Director

Mr. Ioance joined Alpin Sun after more than 7 years of management experience within LMC Group, a business conglomerate active in insurance, real estate, green energy and business consultancy. Between 2005 and 2013, Mr. Ioance held several positions: Project Manager – real estate branch, Head of Investment – real estate consultancy branch, Deputy Director – green energy division, CEO –insurance brokerage branch, Managing Partner – risk management and business consultancy division. Mr. Ioance has proven expertise in: business development, financing, business management, sales, leadership, risk management, marketing, renewable energy. Mr. Ioance holds a degree in Management and several postgraduate courses in business administration, risk management, risk assessment, loss control, marketing, leadership, and negotiation. At Alpin Sun, Mr. Ioance is in charge with business development, international markets, marketing, project financing and risk management.

Company Profile:

ECO PLAN KENYA LTD

Urban, Regional & Environmental Planners (E.I.A/Audit Lead Expert)

Urban, regional, environmental planners, land development consultants, and eia/audit lead experts



CONTACTS:

ECO PLAN KENYA
PO BOX 1364-00502
NAIROBI KENYA
4TH FLOOR OCCIDENTAL PLAZA
MUTHITHI ROAD WESTLANDS
Phone: 0720-645197
E-mail: ecoplankenya@yahoo.com

For a better copy of this please see separate pdf version

THE COMPANY

ECO PLAN KENYA is a registered company concerned with consultancy in planning, development and management of land. We employ state of art tools and techniques such as Computer aided design (CAD) and Geographic Information Systems (G.I.S) in preparation of plans and maps.

ASSOCIATE COMPANIES

Eco Plan Kenya collaborates with Datum Survey and Land Consultants, Zenith Valuers and Developers and Geomeasure Surveys as associate companies in terms of planning, surveying and valuation.

SERVICES

The company offers several services that include:

A. Preparation of land use plans

Types of plans:

- Regional development plans
- Strategic – structure plans
- Master Plans
- Zoning plans
- Site plans i.e. schools, factories, and dams' etc.



KWALE REGIONAL PLAN

B. Consultancy in land use planning

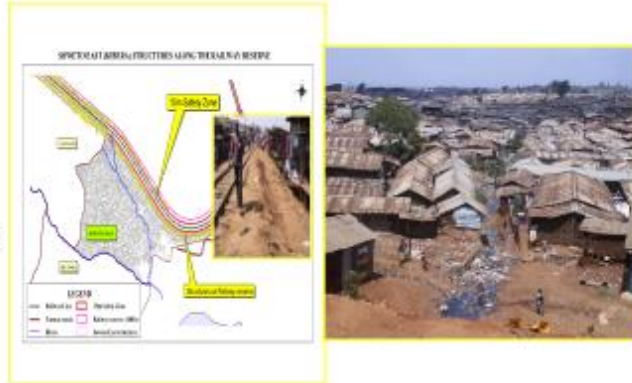
Services in this category include:

- Change of user
- Extension of user
- Extension of lease
- Sub-division schemes
- Land surveying
- Valuation



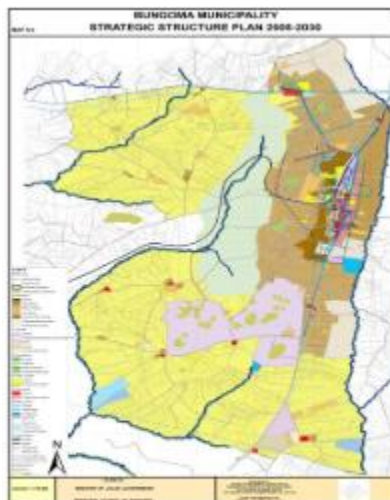
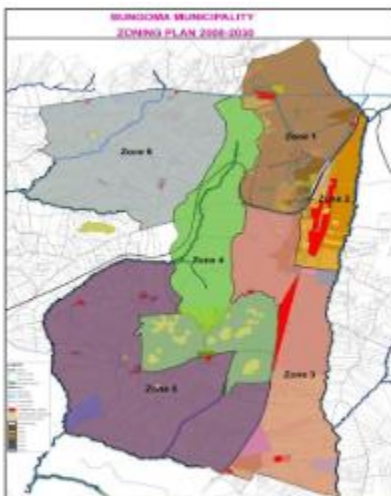
C. Advisory planning

- Planning of informal settlement
- Community based planning
- Advisory on the best use of land
- Human rights approach to planning



D. Tailor Made Mapping

- Maps prepared as per the requirement of the client.
- Preparation of integrated plans
- Topographical mapping



E. Consultancy in Environmental Management

Preparation of:

- Environmental plans
- Environmental impact assessment reports
- Environmental audit reports

F. Geographic information science and earth observation

- Application of remote sensing and geographic information systems in urban and regional planning
- Scientific spatial research – land use analysis (suitability, supply, demand and allocation)
- Accessibility analysis and service location planning
- Project oriented spatial decision support systems (SPDSS)
- Spatial multi-criteria evaluation
- Land use modeling

G. Transport Planning

- Travel demand modeling

WORK EXPERIENCE

LIST OF RECENT PROJECTS

Client	Nature of task	Town	Amount (Kshs.)	Status
Daykio Investments LTD	Change of user and subdivision (100 acres)	Nairobi	2, 500, 000	Completed in 2007
AMS Properties Ltd	Change of user and subdivision (5acres)	Westlands	300,000	Completed in 2009
Waumini Sacco Society	Change of user and subdivision (50 acres)	Mavoko	700, 000	Completed in 2009
Laikipia Teachers Sacco	Change of user and subdivision (100 acres)	Nanyuki	250, 000	Completed in 2008
Agha Khan University	Change of user (200 acres)	Runda	750, 000	Completed in 2009
Bungoma Strategic Urban Development Plan	Urban Planning	Bungoma	54, 000,000	Completed in 2010
Braeburn Schools Ltd	Change of user Braeburn International School (20 acres)	Nanyuki	700, 000	Completed in 2009
AMS PROPERTIES LTD	Change of user Proposed Park Inn Hotel	Westlands	350,000,000	Completed in 2010
Kenol Kobil	Extension of user Of petrol to include storage yard depot and restaurant	Makuyu	2, 500, 000	On going

AMS Propeerties Ltd	Environmental Impact Assessment for the Proposed Residential Estate	Kiambu	400,000,000	Ongoing
Toucan Properties Ltd.	Environmental Impact Assessment for the Proposed Five star Garden Plaza	Mulolongo	350,000,000	Ongoing
Mid Kenya	Environmental Impact Assessment for the Proposed Petrol Station	Isiolo	12,000,000	Ongoing
Kiweso Welfare Group	Environmental Impact Assessment for the Proposed Residential Estate	Kajiado	320,000,000	Completed in 2010
Simon Kinyanjui	Environmental Impact Assessment for the Proposed petrol service station	Kajiado, Isinya	12,000,000	Ongoing

Agnes Wairimu Gethi	Environmental Impact Assessment for the Proposed Rosslyn Green Commercial Centre	Rosslyn Area, Nairobi	215,700,000	Ongoing
AMS Hotel Westlands Ltd	Environmental Impact Assessment for the Proposed Park-inn Hotel	Westlands, Nairobi	350,000,000	Completed in March 2010
Braeburn Schools Ltd	Environmental Impact Assessment for the Proposed Braeburn International School, Nanyuki	Nanyuki	16,000,000	Completed in Dec 2009
Braeburn Schools Ltd	Environmental Impact Assessment for the Proposed Braeside 6 th	Lavington, Nairobi	16,000,000	Completed in Dec 2009

	Form Centre			
Strathmore University	Environmental Impact Assessment for the Proposed Offices	Madaraka, Nairobi	12,000,000	Completed in Dec 2009
Zakaria Abdulsattar Hajji	Environmental Impact Assessment for the Proposed Corniche Residence	Mombasa	469,000,000	Completed in Dec, 2009
Simon Githaiga	Environmental Audit for the Existing Gatundia Petrol Station	Rumuruti, Laikipia	100,000	Completed in June 2009
Rosemary Wanjiru Wachira	Environmental Impact Assessment for the Proposed Shops and Flats	Kahawa Sukari, Ruiru	15,000,000	Completed in March 2009

Earthoil Extracts Ltd	Environmental Impact Assessment for the Proposed Organic Essential Oil Project	Kieni East and Lamuria Central of Laikipia District	11,000,000	Completed in Feb 2009
Strathmore University	Environmental Impact Assessment for the Proposed Strathmore Business School	Madaraka, Nairobi	20,000,000	Completed in Jan 2009
Strathmore University	Environmental Impact Assessment for the Proposed Student Centre	Madaraka, Nairobi	20,000,000	Completed in Dec 2008
Strathmore University	Environmental Impact Assessment for the Proposed Multi-Purpose	Madaraka, Nairobi	20,000,000	Completed in Dec 2008

	Hall			
Strathmore University	Environmental Impact Assessment for the Proposed Management Science Building	Madaraka, Nairobi	20,000,000	Completed in June 2008
G.K.Mukofu and A.K.Mukofu	Environmental Impact Assessment for the Proposed Commercial cum Residential Flats	South C, Nairobi	16,000,000	Completed in May 2008
Waka Entreprises Ltd	Environmental Impact Assessment for the Proposed Residential Flats	Ruaka	250,000	Completed in feb, 2008

Ministry of local Government P.O Box 30004-00100 Nairobi	Consultancy Services for Digital Topographical Mapping and the Preparation of Strategic Urban Development Plans for Garissa Town (2008-2030)	Garissa Town	20,000,000	Completed in December 2010.
Client: Ministry of local Government P.O Box 30004-00100 Nairobi	Consultancy on Mapping and the Preparation of Integrated Strategic Urban Development Plan (ISUD) for NarokTown(2012-2030)	NarokTown	13,000,000	Completed in December 2012.

Ministry of local Government P.O Box 30004-00100 Nairobi	Consultancy on Mapping and the Preparation of Integrated Strategic Urban Development Plan (ISUD) for Bomet Municipality (2013- 2030)	Bomet Town	15,000,000	Completed in April 2014
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STAFF

The company has potential staff, they include the following:

1. Geoffrey Njoroge- BSc. Geography, M.A Urban Planning, MKIP, M.K.E.A, Lead Expert: .Principal Consultant
2. James Gachanja; BA Planning, MSc Geographic Information Science and Earth Observation for Urban Planning and Management and CAD expert.
3. Anthony Githaiga BA Urban Planning CAD and GIS expert
4. Charles Kimani BA Urban Planning CAD and GIS expert
5. J. Kabubo; diploma in water engineering I.C.T expert
6. Elizabeth Wanjiru Dip. Buisness Adminstration- administartion department
7. Sospeter Njeru - B.A Business Administartion department

Equipment

The company is well equipped for the purpose it is established. Eco plan Kenya has many types of equipment, which assist in giving a complete service to its clients'. We have well equipped office, which maintains current standard information and communications technology that enables us to use modern ICT services. The company is in a continuous process of upgrading all office equipment & facilities to the best current available technology. The following table shows the different types of office and field equipment available.

Item	Unit	Quantity	Remarks
Computers (Pentium)	No	3	This is loaded with up to date software programsto facilitate the proper design, planning and management of projects
Lap top computers (Pentium)	No	4	All are loaded with up to date software programsto facilitate the proper design, planning and management of projects
Photocopier cum printer scanner	No	1	
Vehicle (4 x 4)	No	2	
GPS	No.	1	
Office space	m ²	50	

OTHER AVAILABLE TOOLS: HP Colour Laser Jet 2600n,
Large format OCE 2024 plotter
Kyocera 3232 E Color Photocopier, Printer, Fax
Kyocera 1635 Photocopier
HP 1280 A3 Printer
Digital Cameras
Digital overhead projector.
Sub Metre hand held GPS

CVs

PRINCIPAL CONSULTANT

NAME OF FIRM: ECO PLAN KENYA LTD

NAME OF STAFF: GEOFFREY NJORGE

PROFESSION: PHYSICAL PLANNER

DATE OF BIRTH: 16 th December 1959

Years with Firm: 9 years Nationality: Kenyan

Membership in Professional Societies:

- Corporate member Kenya Institute of Planners (KIP)
- Member Kenya Institute of Environmental assessors

Detailed Tasks Assigned:

- Coordinating the Project Activities
- Liaison officer with Client

Key Qualifications:

Mr. Geoffrey Njorge is a highly trained, experienced and accomplished physical planner with 25 years of experience in urban and regional development. He has very good academic credentials having obtained two Masters Degrees in Urban and Regional Planning and Geography. He has also undergone short courses on regional development planning and environmental issues thus cementing His capabilities.

Mr. Njorge worked as the Physical Planner in charge of the preparation of Physical Development Plans for many urban centers and human settlement schemes in Nyeri District, Muranga, Trans Nzoia, Samburu, Laikipia, Garissa and Mandera Districts.

Other Relevant Assignments that he has undertaken over time include

- Bungoma Strategic Urban development plan 2008-2030
- As a provincial physical planner in Central province he coordinated the planning of the

colonial era villages in Nyeri district.

- Prepared a development plan for Mariaini Township in Muranga District
- Prepared zoning plans for Bulla Pesa, Kampi Oda and Kampi Bulle estates in Isiolo Town.
- As an assistant provincial physical planner for North Eastern province, he prepared the physical development plans for Daadab and Sankuri and Rhamu Centres
- As a registered lead expert in Environmental Impact Assessment and Environment Audit, (EIA/EA) Mr. Njoroge has overtime been contracted to carry out several environmental impact assessment studies and audits.

2006 to Present - Principal Consultant, Eco Plan Kenya

Duties include:

- Providing consultancy on the issues of environment through undertaking Environmental Impact Assessments and Environment Audit
- Providing consultancy in Town Planning, Regional Planning and Development.
- Providing consultancy in planning of informal settlement, planning of major housing schemes, industrial and commercial areas.

2006 to Present - Principal Consultant, Eco Plan Kenya

Duties include:

- Providing consultancy on the issues of environment through undertaking Environmental Impact Assessments and Environment Audit
- Providing consultancy in Town Planning, Regional Planning and Development.
- Providing consultancy in planning of informal settlement, planning of major housing schemes, industrial and commercial areas.

2003- 2006, Senior Physical Planner in the Ministry of Lands and Settlements

- Was in charge of the Development control section of the Physical Planning Department. Ensured that all the development is controlled through preparation of the change of users, extension of users, subdivisions and extension of leases. Checked and ensured that all the requirements in the development control were adhered to.
- Coordinated the physical mapping of Kibera's Soweto East village. This is an informal development where the main agenda was to upgrade the informal settlement. This was a government programme in collaboration with KENSUP and UN Habitat.

2001-2003: Provincial Physical Planner in Central Province

- In charge of Central Province and was in charge of the development in the whole of the province.
- Was a team leader of a task force composed of physical planners in the central province and other stakeholders for the preparation of development plans for the colonial Era villages in Nyeri municipality which included Kamuyu, Gatathi-ini, Kihatha, Kihuyo and Kiamwathi villages.

1984-2001; District Physical Planning Officer, Ministry of Lands and Settlements

- In charge of six (7) Districts, i.e. Muranga, Isiolo, Trans Nzoia, Samburu, Garissa and Laikipia District. During this time he was responsible for the following:
 - Preparation of the development Plan for Mariaini –ini village Muranga District
 - Preparation of the development Plan for Bulla Pesa, Kampi Oda and Kampi Bulle estates in Isiolo Towns.
 - Preparation of the development Plan for Kaiasagat and kamila Centres in Trans Nzoia District
 - Preparation of the development Plan for maralal Town , Baragoi, Archers post and Wamba Centers and Samburu district
 - Development Plan for Thiru centre in Laikipia District
 - Preparation of the Development Plans for Daadab and Sankuri Centres in Garissa District and Rhamu Centre in Mandera district.

Selected Consultancies:

2008-present: principal consultant Bungoma Strategic Urban Development Plan -2008-2030

Responsible for:-

- Physical planning
- Subdivision scheme design for 100 acre farm.

2008-2009 principal consultant subdivision and change of user-Daykio Investments in Njiru

Responsible for:-

- Physical planning
- Subdivision scheme design for 100 acre farm.

2008-2009 principal consultant subdivision and change of user for Waumini Sacco Society

Responsible for:-

- Physical planning
- Subdivision scheme design for 50 acre farm

2008-2009 principal consultant subdivision and change of user for Agha Khan University

Responsible for:-

- Physical planning
- Subdivision scheme design for 200 acre farm

2007-2008 principal consultant subdivision and change of user for Laikipia Teachers Sacco

Responsible for:-

- Physical planning
- Subdivision scheme design for 100 acre farm

2007-2008 principal consultant Digital Mapping ,Organic Essential Oil project, Kenya

Responsible for:-

- Digital mapping of the project area showing land parcels, infrastructure, and physical features
- Mapping of Parcels belonging to project farmers
- Mapping of individual farms and indicating portion under organic plants
- Creating a Geographic Information System (GIS) data base with attribute data on parcel number, ownership details, total land area, land area under organic plant, and other land uses. For the entire project area

Responsible for:-

- Digital mapping of the project area showing affected land parcels, infrastructure, and physical features.
- Creating a Geographic Information System (GIS) data base with attribute data on parcel number, ownership details, type of structures and other land uses. For the entire project area
- Coordinating Field work /field survey
- Data acquisition and processing

. Languages:

	<u>Speaking</u>	<u>Reading</u>	<u>Writing</u>
English	excellent	excellent	excellent
Kiswahili	“	“	“
Kikuyu	“	“	“

Responsible for:-

- Digital mapping of the project area showing land parcels, infrastructure, and physical features
- Mapping of Parcels belonging to project farmers
- Mapping of individual farms and indicating portion under organic plants
- Creating a Geographic Information System (GIS) data base with attribute data on parcel number, ownership details, total land area, land area under organic plant, and other land uses. For the entire project area
- Coordinating Field work /field survey
- Data acquisition and processing

2003-2004, Digital mapping Consultant, Resettlement of squatters encroaching on Railway Reserve, Kenya.

POSITION: ASSOCIATE PLANNER

NAME OF FIRM: ECO PLAN KENYA

NAME OF STAFF: ANTHONY MWANGI GITHAIGA
PROFESSION: PHYSICAL PLANNER
DATE OF BIRTH: 1983
Years with Firm: 7 **Nationality:** Kenyan

Membership in Professional Societies:

- Member of Kenya Institute of Planners.

Detailed Tasks Assigned:

- Carryout GIS tasks
- Carry out Project Physical Planning
Activities for clients
- Assist in team activities such as public sensitization
- Assist planning coordinator
- Digital mapping

Key Qualifications:

Mr. Githaiga is a trained and experienced physical planner. He undertook a degree in Urban and Regional Planning and attained Second class honors. He has experience is in the preparation of Integrated Development Plans of up coming towns and Regional Physical Development Plans. This ranges from the development of tools for data collection, data inputting, analysis using the modern statistical packages and report writing. The data collected focuses on broad thematic areas that include the economic sector, human settlement, infrastructure, institutions, social and cultural sector, population and environmental data. He has also been engaged in physical planning and Environmental Impact Assessment (EIA) consultancy.

Mr. Githaiga has developed keen interest in Geographic Information Systems that are applied in the mapping of information collected on the ground. This is through the use of software such as Arc GIS, Arc View, Auto CAD and Adobe Photoshop. This knowledge has thus facilitated production of quality work that is visually represented in the developed maps.

Experience acquired while studying at the university

COLLABORATIVE RESEARCH EXPERIENCE:

Participated in the formulation of:

- **April 2006 to August 2006.** Chinchilla Division Rural Development Plan.

- **September 2006 to May 2007.** Nandi Hills Urban Development Plan.

- **September 2007 to July 2008.**TransNzoia Regional Development Plan

- **August 2010 to December 2010.** Preparation of Bungoma Municipality Strategic Development Plan.

Duties:

- Base map preparation
 - Constituting questionnaires
 - Identification of key respondents
 - Administering questionnaires
 - Conducting focus group discussions
 - Analysis of findings
-
- Dissertation on impacts of rural electrification in development

Education:

Bachelor of Arts , Urban and Regional Planning, Maseno University ,Kisumu,Kenya,2004-2008

Other Relevant Training

General computer skills in Ms Office packages Internet and E-mail

Employment Record:

Sept 2008; Ecoplan Kenya

Has been an associate planner with Eco Plan Kenya, the main responsibilities include:

- Undertaking field work through spatial data collection for purposes of planning.
- Undertaking field study through collection of economic and social data that is used for planning purposes.
- Synthesis of the data collected from the field and thus:
 - Preparation of Environment Impact Assessments (EIA) on any development that is likely to have a major impact on the environment.
 - Preparation of planning briefs which analyze any site that has been proposed for development.
 - Preparation of tailor made maps to suit specific project requirements.

Jan -March 2008: Ministry of Lands- Physical Planning Department:

Was under Internship where he participated in the

- Carried out field survey
- Analyzed data from the field survey.
- Wrote reports based on survey findings.
- Organized and participated in focused group discussions.
- Presented the plan to the stakeholders.

Languages:

	<u>Speaking</u>	<u>Reading</u>	<u>Writing</u>
English	excellent	excellent	excellent
Kiswahili	"	"	"
Kikuyu	"	"	"

CURRICULUM VITAE (CV)-JAMES NJIRAINI GACHANJA

1.0 Personal Information

Name:	James Njiraini Gachanja
Date and place of birth:	22 nd June, 1982, Nairobi, Kenya
Sex:	Male
Marital Status:	Single
Nationality:	Kenyan
Education:	MSc Urban Planning and Management, ITC, The Netherlands
Current position:	Associate Consultant, Eco Plan Kenya
Address:	P.O.Box 53113-00200, Nairobi, Kenya
Mobile No.	+254-731-960254
Email:	njirainigachanja@gmail.com

2.0 Academic Qualifications

SCHOOLS/UNIVERSITIES	PERIOD	CERTIFICATE/ DEGREE AWARDED
University of Twente- International Institute for Geo- Information Science and Earth Observation (ITC), Enschede, The Netherlands	September 2008 - March 2010	Master of Science (MSc) in Geo- Information Science and Earth Observation for Urban Planning and Management (with distinction)
Maseno University, Maseno, Kenya	September 2002 – September 2006	Bachelor of Arts (BA) Urban and Regional Planning (First Class Honours)
Kagumo High School, Nyeri, Kenya	January 1997 - December 2000	Kenya Certificate of Secondary Education (KCSE)

2.1 MSc Thesis

Gachanja, J.N. (2010), Towards Integrated Land Use and Transportation Planning: Evaluating Accuracy of the Four Step Transport Model using the Case of Istanbul, Turkey. ITC, Enschede.

2.2 BA Dissertation

Application of Geographical Information Systems (GIS) in Urban Planning: Management of Informal Settlements in Nairobi, Kenya.

2.3 Other courses attended

a) June 2009, Master class on Geo-spatial and SDI developments by Vrij Universiteit, Amsterdam and TU Delft, Delft, held at the World Trade Center(WTC) in Rotterdam, The Netherlands.

b) January 2000 CPA 1 –Strathmore College Nairobi, Kenya

2.4 Fellowship and Awards

2008: Netherlands Fellowship Programme- NUFFIC scholarship for MSc studies at ITC in the Netherlands.

2.5 Technical and computer skills and competences

- a) Geographic Information Systems (GIS) - ESRI ArcGIS suite and extensions
- b) Remote Sensing- ERDAS Imagine, ILWIS, google earth.
- c) Computer Aided Design (CAD): AutoCAD
- d) Land use modelling- ILWIS SMCE, CommunityVIZ and Flowmap; Cellular automata modelling for land use planning.
- e) Transportation Planning and modelling/ Travel Demand Modelling using the four step transport model and Flowmap, OmniTRANS and CUBE software applications. Activity based modelling
- f) Integrated Land use and Transportation Modelling- Metronamica/Geonamica
- g) Agent based modelling- Netlogo
- h) Flood modelling- using Sobek software application.
- i) Monitoring intra urban dynamics – poverty, equity, infrastructure, transport, services, urban growth, urban change, land use demand, supply and suitability analysis.
- j) Policy analysis, evaluation and decision support- ILWIS Spatial multi-criteria evaluation (SMCE) and scenario development and analysis
- k) Statistical analysis- Statistical package for social sciences (SPSS) and MS excel
- l) Graphic design- Adobe photoshop and Coreldraw

3.0 Employment Record

Country	Kenya
Dates	October 2006 to date
Name and address of employer	Eco Plan Kenya, P.O. Box 1364-00502 Karen, Nairobi
Occupation and position held	Associate consultant
Main activities and responsibilities	Consultant manager, plan preparation, report writing, technical operations (CAD and GIS), research, portfolio development, field work and administration
Type of business or sector	Urban and Regional Planning(physical planning) and Environmental Management
Country	Kenya
Dates	January 2006- June 2006

Name and address of employer	Republic of Kenya, Ministry of Lands, Physical Planning Department, P.O. Box 45025 Nairobi
Occupation and position held	Intern
Main activities and responsibilities	Plan preparation, research, report writing, fieldwork, conference management, technical operations
Type of business or sector	Government Ministry Department

3.1 Other Key Qualifications and Experience

a) January 2006- Under the Republic of Kenya, Ministry of Lands, Physical Planning Department headquarters in Nairobi, I participated in the data capture and validation exercise for the Geographic Information Systems (GIS) based Kibera Slum Upgrading exercise facilitated by the Swedish International Development Agency (SIDA) for the Kenya Slum Upgrading Programme (KENSUP).

b) March 2006- Under the Republic of Kenya, Ministry of Lands, Physical Planning Department headquarters in Nairobi, I participated in the preparation of the Kwale and Mombasa Mainland South Physical Regional Development Plan. Activities involved field study, participatory workshops with stakeholders in Mombasa and Kwale, research, data analysis and report writing.

c) June 2006- Under the Republic of Kenya, Ministry of Lands, Physical Planning Department headquarters in Nairobi, I participated in the preparation of the Kisumu-Nyando Physical Regional Development Plan. Activities involved field study, participatory workshops with stakeholders in Kisumu and Nyando, research, data analysis and report writing.

d) July 2006- Participated in the preparation of the Obunga Informal Settlement Advisory Plan in Kisumu, Kenya. Was engaged in participatory stakeholder workshops with the local community, field study and plan formulation.

e) October 2006- participated in plan formulation and proposal for the Wildlife Migratory corridor for Nairobi National Park through Kitegela, Isinya, and the larger Kajiado District.

f) October 2006 to date - Under Eco Plan Kenya - i am engaged in preparation of land use plans, regional development plans, strategic - structure plans, zoning plans, site planning and integrated plans. Consultancy in land use planning, change of user, extension of user and sub-division schemes. Advisory planning and planning of informal settlements, community based planning, human rights and participatory approaches to planning. Tailor made digital mapping as per the requirements of the client using CAD/GIS. Consultancy in environmental management including preparation of environmental plans and environmental impact assessment /Audit reports

g) March 2009- Participated in the CORDAID Urban Challenge held in The Hague, The Netherlands. Activities involved preparation of project proposal for sustainable solid waste management for the informal settlement of Philippi in South Africa, achieved second position and special mention for professionalism.

h) September, 2009- Participated in the 10th Transportation Forum "Vision 2023" in Istanbul, organised by Ministry of Transport and Communication, Turkey. I gained insight to Transportation Planning issues and practices.

i) February 2010- Participated in the Energy Battle 2010 held in Groningen in The Netherlands. Activities involved research on cleaner and greener energy solutions for a variety of multinational corporations in The Netherlands; proposed "the green scooter" which uses upgraded biogas fuel as an innovative solution towards sustainable energy use.

j) March 2010- Engaged in the finalisation of the Bungoma Structure Plan 2009-2030 with a focus on GIS digital mapping and planning.

4.0 Organisational skills and competences

a) Staff recruitment, training and supervision at Eco Plan Kenya

b) Client and portfolio management at Eco Plan Kenya

c) Office administration and management.

4.1 Artistic and social skills and competences

a) Interest in theatre, literature, poetry, music, art and crafts.

b) Interest in urban recreation, urban debate, forums and active as an urban culture social agent

c) Participated in the 2009 Batavierence marathon race under the ITC team(run for fun) in the Netherlands

C) Engaged in rugby as a player and supporter

d) Together with colleagues I am a member of an investment club/ self-help group

5.0 Membership in professional organisations

a) Member - Kenya Institute of Planners (KIP)

5.1 Languages

	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Kiswahili	Good	Good	Good

POSITION:

ASSISTANT PHYSICAL PLANNER

POSITION:ASSOCIATE PLANNER

NAME OF FIRM: ECO PLAN KENYA LIMITED

NAME OF STAFF: **MUCHAI CHARLES KIMANI**

PROFESSION: PHYSICAL PLANNER

DATE OF BIRTH: September 1987

Years in the company: 5 **Nationality:** Kenyan

Detailed Tasks Assigned:

- Carryout GIS tasks
- Assist in team activities such as public sensitization
- Assist planning coordinator
- Digital mapping

Key Qualifications:

Mr. **Muchai** is a trained and experienced physical planner. He undertook a degree in Urban and Regional Planning and attained First Class Honors. He has experience in the preparation of Integrated Development Plans of up coming Towns and Regional Physical Development Plans. This ranges from the development of tools for data collection, data inputting, analysis using the modern statistical packages and report writing. The data collected focuses on broad thematic areas that include the economic sector, human settlement, infrastructure, institutions, social and cultural sector, population and environmental data. He has also been engaged in physical planning and Environmental Impact Assessment (EIA) consultancy.

Mr. Muchai has developed keen interest in **Geoinformation technology** that is applied in the mapping of information collected on the ground. This is through the use of software such as Arc GIS, Arc View, Auto CAD and Adobe Photoshop. This knowledge has thus facilitated production of quality work that is visually represented in the developed maps.

Experience acquired while studying at the university

RESEARCH EXPERIENCE:

2008-2009: Carried out a Planning Research Thesis Titled “**Impacts of Rapid Urbanization in Peri Urban Areas- A case study of Ruaka-Kiambu district**”

2008-2009 Carried out a Planning Development Project Titled “**Designing Transport Circulation in Ruaka- Towards Sustainable Neighborhood Growth**”

2008-2009 Involved in Regional Physical Planning studio in the preparation of a Regional Physical Development Plan- Kakamega East district for the County Council of Kakamega.

2007-2008: olved in Urban Physical Planning studio in the preparation of Local Physical Development Plan for Juja Town in the County Council of Thika. The theme was planning a future University Town.

2006-2007 Involved in Rural Physical planning Studio in preparation of a plan for Ondiri swamp in Kikuyu. The concept was planning for sustainable use of common resources with emphasis on wetland areas as fragile ecological zones.

2005: Involved in Site planning Studio on Re-planning Programme of Toi Market, Kibera in Nairobi. The activity involved data collection, analysis and preparation of alternative designs.

Task assigned:

- Base map preparation
- Constituting questionnaires
- Identification of key respondents
- Administering questionnaires
- Conducting focus group discussions
- Analysis of findings
- Plan formulation

Education:

Bachelor of Arts , Urban and Regional Planning, **Nairobi University** ,Kenya,2005-2009

Other Relevant Training

Research skills:

Data collection, data cleaning, coding and analysis

Computer skills:

Ms Office

ArcGIS 9.2 and Arcview 3.2

CAD (AutoCAD and ArchCad

Statistical package of social science (SPSS)

Google sketch up pro (3D model)

Internet

Employment Record:

Sept 2009; Ecoplan Kenya

Has been an associate planner with Eco Plan Kenya, the main responsibilities include:

- Undertaking field work through spatial data collection for purposes of planning.
- Undertaking field study through collection of economic and social data that is used for planning purposes.
- Synthesis of the data collected from the field and thus:
 - Preparation of Environment Impact Assessments (EIA) on any development that is likely to have a major impact on the environment.
 - Preparation of planning briefs which analyze any site that has been proposed for development.
 - Preparation of tailor made maps to suit specific project requirements.

June- September 2008: Lutheran world federation

Worked as a camp planning officer, Dagahaley Camp, Dadaab, Garissa

Responsibilities

- Implementation of UNHCR camp design plans
- Development control and restriction of encroachment
- Seminars and workshops for sensitizing refugees on issues of physical planning and community development through participatory approach

Languages:

	<u>Speaking</u>	<u>Reading</u>	<u>Writing</u>
English	excellent	excellent	excellent
Kiswahili	“	“	“
Kikuyu	“	“	“



Portsmouth Sustainable Energy & Climate Change Centre - PSECC
Facilitators for Climate Change Mitigation - Renewable Energy Technologies, Advice, Grants & funding.



PSECC has been formed to provide advice, support and guidance on Climate Change, Global Warming, Renewable Energy, Grants and Funding provision for the people of Portsmouth, Portsmouth & Hampshire Council's, Governments, schools, colleges, Commercial & International clients.

Do not leave Global Warming to others, we must do more, energy efficiency also Renewable Energy - Solar PV, Biomass, Wind & Water Turbines, Carbon Capture & Storage & Nuclear, do we risk limited action, can we take the risk?? NO

Welcome PSECC is a not for profit organization - Facilitators in Climate Change Mitigation.

Kenyalight – Project Ltd CV's (Founder from PSECC)



Kenyalight Project Limited - a social enterprise
 Solar PV- for the people of kenya - Clean Energy for all. Solar Computers to...



Solar Farm at Nakuru 25MW and also possibly in our development programme will be off grid at a later date -

OFF GRID SOLAR PV
FOR VILLAGES,
& SCHOOLS

bringing clean, green off grid energy to families & schools in rural Kenya

a hybrid social enterprise that provides clean energy via solar-powered home systems for off-grid communities



39 Woodhay Walk
Havant
Hampshire PO9 5RD

Mobile: 07763 - 977634
Tel' No. 02392 - 474799
E-Mail: alan@psecc.com



ALAN BREWER MSc.

Diligent, hard worker, respectful, presentable, loyal and enthusiastic, able to identify a business opportunity and run with it to a successful conclusion. Good technical abilities, eighteen years environmental engineering, energy, waste, renewables, solar PV, development work and Climate Change mitigation. Manufacturing and computer experience also over six and eight years respectively.

International & UK development management experience, Renewable Energy, Solar & Waste sectors. ESCO formations / Project Management - Solar PV / Biomass / Ground source sectors / all Renewable Energies. Grant & funding sourced for ESCO's, Senior level negotiation and development experience, PROJECT MANAGEMENT - Gasification, Solar PV, good facilitator of sales and marketing strategies, especially Solar, Gasification, Biomass, Waste, Climate Change mitigation, CRC, Renewable's, Waste Strategy & Policy formulation, energy efficiency, recycling, environmental management and waste disposal experience.

Extensive experience of developing International business opportunities in Waste & Solar PV sectors, over eighteen years presenting CRC, Agenda 21 Sustainable Development programmes to Council officials, companies - Energy, Renewable, Energy Efficiency, Construction, Housing and Waste Sector experience. BREEAM Schools Advisor.

Skills

Project Management Driving Climate Change CO₂ reduction– Highcross Property Management
Development Manager - Solar Farm development, Wind Turbines - Energy Policy & Strategy
Renewable Energy Business Development Manager over eighteen years, Solar, EFW, Biomass
International sales development – Solar, Waste Management & Solar PV Commercial and Private
Engaging Communities in the Waste & Solar PV market place & Sustainable Development
Environmental Engineering – Renewable Energy & Waste sectors
Project Management in both sectors of Renewable Energy & Waste
International Development management in Renewable Energy, Energy & Waste sectors
ESCO formations for Solar PV and Biomass. - fund raising for ESCO's,
International negotiation and development management experience over eighteen years
Climate Change Mitigation

Energy Coordination of Energy Network – Renewable Energy Hampshire County Council appointment
Sustainable Energy Policy & Strategy formulation Portsmouth City Council appointment
BREEAM schools advisor – sales development at County level & Educations sectors.
Ski Technician

Member of the Chartered Waste Management Institute & Affiliate member of the Energy Institute

Previous Employment

Project Manager – to Highcross Property Management – CO₂ reduction in business centres – Nov' 2012 -

**Development manager - Self Employed – UK Solar Sales, Kenya & Zambia Village Solar Grids /
Gasification Solar PV business development UK Colleges. Mar' 2012 to Nov' 2012**

**Development Manager - Freetricity Ltd – Solar Sales UK 22 schools and colleges Mar' 2011 to Mar' 2012
Free Solar PV programme**

Development manager - Portsmouth City Council – Solar PV advise –16 schools May 2010 to Feb' 2011

British Gas – Partnership – ITPower Ltd Business Devel' Solar PV–7 schools Mar' 2008 to June 2010

**Consultant – Partnership - Sustainable Energy Installations Ltd) Jan 2006 to Mar' 2008
for Hampshire – County Council - Solar PV for Schools**

**Development – Energy Network coordinator - Hampshire County Council April 2004 to Nov' 2006
Renewable Energy assessment for the County**

**Energy Business development Manager – Sovereign Ltd Feb' 2003 to April 2004
Environmental advisor for Sustainable Energy & Integrated Waste Management. South Sudan Energy /
Environmental Policies / Strategy advice, Coordination of Renewable Energy development between
Hampshire County Council, Hampshire Natural Resources Initiative, Rushmoor Borough Council.**

**Formation and Chairman, Southeast Chamber of Commerce Jan' 2002 to Feb' 2003
Formed Energy Focus Group in Hampshire Promotion of Wind, Solar,**

Energy Crops and Green Energy supply

Business Development Manager, MSW Waste sector, International Mercantile Group	June 1996 to Dec' 2002
Development of International Waste Management consortium, feasibility study writing. Hampshire County Waste Strategy and provision to the group of nine International cities for waste disposal contracts. Gasification EFW Instigated Energy Crop programme with the Ministry of Agriculture, Fisheries & Food (MAFF-DEFRA) in two English Counties, West Sussex and Hampshire Climate Change - arranged all technological choices and finance/insurance package. Written Integrated Waste EFW Management reports for Russia, India, Hong Kong, Bulgaria, Poland, Riyadh, Doha, Winchester, Hampshire, Brighton, Edinburgh and Moscow. Six month research - Sustainable Development energy policy and strategy formulation Working party member for: energy from waste, environmental management, transport, and energy efficiency, renewable energies of solar, wind, water, cogeneration and recycling.	
Trainer, Nynex Communications - Home Sales development and training	1993/1994
Ski Technician	1993/ongoing
Energy, Brytec, Hayling - energy sales, low energy lighting systems	1991/1993
Senior Computer Data Processing Officer, British Telecom, Portsmouth	1980/1990
Electrical / Mechanical Maintenance Engineer, Solent Repetition, Portsmouth	1968/1974
<u>Education and Qualification</u>	
Breeam Education Assessor training for Schools & Community Renewables (CAT)	2008 - 2006
Chartered Waste Management Institute & Affiliate member of the Energy Institute	2006
Practical Wastes Management Course - Certificate	2004
Graduate, Member of Chartered Institute of Waste Management UK	2003
MSc. Environmental Engineering - University of Portsmouth - Majored in Energy	1995
PgDip. Environmental Engineering - University of Portsmouth	1995
PgCert. Environmental Engineering - University of Portsmouth	1994
NVQ (IV) Management - Portsmouth	1993
C.Ed.Environmental Science - University of Plymouth	1980
O.N.Dip. Sciences - Highbury Technical College, Portsmouth	1976



JOSEPH (JOE) MWAI

Joe Mwai (centre) Co-founder of Kenyalight-Project Ltd

Pictured at Kenya London Embassy in London

PERSONAL INFORMATION

Name:	→	JOSEPH (JOE) MWAI
Age:	→	51
Nationality:	→	Kenyan
Marital Status:	→	Married
Languages:	→	fluent English
	→	Other Kenya dialects

Contacts:	→	Cell phone: 0717 020 125
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CAREER OBJECTIVES

Bring Sustainable Energy to the people of Kenya - Climate Change Mitigation & Global Warming – formation and partner in IEDL Project. Development of Off Grid and also Mini Grid Solar Pv systems for the people of Kenya.

Diplomat – Arranging & conduction all meetings with Government officials for the promotion of Non Tender Solar PV projects throughout Kenya.

Prepare Sustainable strategies to address the problems and barriers associated with good project completion and determine optimum solutions. Assess the abilities of team members, determine their strengths and weaknesses. Motivate them on their strengths, whilst managing the process of achieving the plan to a successful outcome both in good time and within budgetary strategy.

Cardinal leader driven by affinity passion for self-actualization with vision, flair and proven sagacious business acumen, highly experienced at board level with years of experience, with bespoke qualities as a Motivational speaker, community leader, church elder, self-educating student in three disciplines of academy.

Key expertise

- Team Leadership Management
- Motivation
- Community Leadership Project management
- Building Management
- IP networking video broadcasting
- IP network video surveillance
- Electronic surveillance systems
- Video surveillance systems
- Access control systems
- Alarm transmission and notification
- IT hardware and software support
- IT operating system support
- Internet Protocols and configuration
- Programming
- Solution Integrator

ACADEMIC BACKGROUND

SELF EDUCATED

Senior ICT (Support Engineer) with over ten years' experience in designing, installing, commissioning, maintaining and project management, directing operations in a wide range of information technology solutions for the security industry, with high abilities to assess problems, motivate managers involved in the problem, motivating them to discuss their views, quickly and assemble facts.

COMPUTER PROFICIENCY

& Technical Understanding

COMPUTER PROFICIENCY

- ✓ Ms Windows XP
- ✓ Ms Word XP
- ✓ Ms Excel XP
- ✓ Ms Access XP
- ✓ Ms PowerPoint XP
- ✓ Internet & E-mail
- ✓ Quick Books

Climate Change Mitigation and Development process for IEDL Projects - Solar Farms, Off Grid and Mini-Grid systems for the people of Kenya.

On-going product development training in all aspects of Renewable Energy such as Solar, Wind, Biomass and Hydro-electricity.

Skills

Director of IEDL – Responsible for Government meetings and obtaining Authorization letters to progress forward Solar Farms projects throughout Kenya

CCTV skills – Director of own company

- Video transmission and broadcasting over IP networks, for unicast, multi- cast and multicast applications.
- Video transmission over PSTN, ISDN and ADSL leased lines, Ethernet, radio, microwave, optical fibre.
- IP video surveillance systems.
- Digital video surveillance systems
- Analogue video surveillance systems
- Covert and discreet surveillance systems
- M-JPEG, M-JPEG2, M-JPEG4, H. 264
- Access control systems using proximity card readers and biometric technologies
- Radio Ethernet systems at 2.4Ghz, 5Ghz and 10.5 GHz
- Fire alarms
- Intruder alarms
- Mobile radio communication systems including paging CT2 Dect PMR and PBR
- IP network switches bridges routers
- HTML, XHTML, CSS, PHP, MySql and JavaScript

- Apache and Internet Information Server

Career History

1986- 1989 Assistant Farm Manager- Githere Investment Ltd (Kenya)

1989 1992

Director- Abyss Construction Ltd (Kenya)

1992- 1993

Assistant Shop manager- Piccadilly Circus (UK)

1994- 1998

Director- Imperial Car wash- (UK)

1993- 2006

Chairman Kenya welfare association (UK)

1998 2003

Legal advisor- Liberty solicitors- (UK)

2003- 2006

Director- Basewood Security Ltd (UK)

2006- Current

Director- Integrated CCTV Security Ltd (UK)

2006- 2013

2011- Attained Diploma as a system integrator with AgentVi system integrators

Chairman- Integrated CCTV Security Ltd (EA)

HOBBIES & INTERESTS

Interests

I am a 51 year old Kenyan citizen with permanent residence in the UK. My main out of work interests includes the following:

Going to theatre, watching sports, Go – carting; self-educating in Physics, Astronomy, Neuro- science, the science of thought, Motivational subjects.

Am also a Motivational Speaker as well as a professional Master of Ceremony.



CAROLINE NYAKOABI MWAI

Legal Advisor & Project Marketing IEDL – Projects Ltd

PERSONAL INFORMATION

Name: → Caroline Nyokabi Mwai
Date of birth: → 5th January 1986
Nationality: → Kenyan
ID No: → 24740055
Gender: → Female

Marital Status: → Single

Languages: → fluent English
→ & Kiswahili

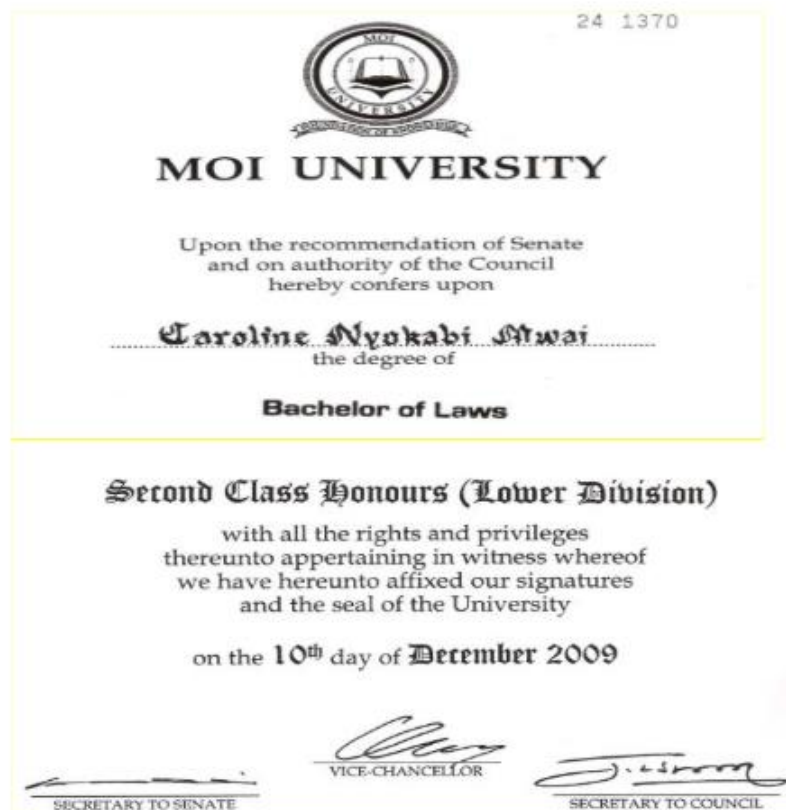
Contacts: → Cell phone: 0720-790609
P.O Box 10558-00100
Email- karol-IEDL@uwclub.net

CAREER OBJECTIVES

Drive forward & Develop Climate Change Mitigation projects in Kenya, bringing Sustainable Energy to the people of Kenya. Strive to achieve the best in my career, to use my skills, experience and quest for knowledge to elevate the standards of a dynamic Organization, and in so doing, optimize the contribution in improvement of quality of life and subsequently the society and the economy. I aspire to reach the highest level in my profession. I am looking for a challenging working environment where I can utilize my skills and expand my horizons. My aim is to help the Organization achieve its goals, which in return will enable me to make a positive difference in my society and in the long term a big contribution to the Country and the world.

ACADEMIC BACKGROUND

PERIOD	INSTITUTION	CERTIFICATE / DIPLOMA
Jan 2011 to December 2011	Coalition On Violence Against Women	pupilage
Jan 2010- Nov 2010	The Kenya School of Law	Post graduate diploma
Dec 2009- to date	KASNEB	CPS
Aug 2005- May 2009	Moi University	Bachelor of Laws Degree 2 nd class honors
Feb 2001- Nov 2004	Karima Girls High School Secondary	Kenya Certificate of Education B Plain
Jan 1993 – Nov 2000	Limuru Model Primary School	Kenya Certificate of Primary Education



**COMPUTER PROFICIENCY
& Technical Understanding**

COMPUTER PROFICIENCY

- ✓ Ms Windows XP
- ✓ Ms Word XP
- ✓ Ms Excel XP
- ✓ Ms Access XP
- ✓ Ms PowerPoint XP
- ✓ Internet & E-mail
- ✓ Quick Books

WORK EXPERIENCE

March 2013 to present	Legal Advisor & Project Marketing IEDL – Projects Identification of all legal requirements for the operation of IEDL Projects. Arranging all required meetings and development of phase one & Phase two of IEDL project – 500 home Solar PV off grid systems.
January 2012 to March 2013	Integrated CCTV security Ltd Chief Operations Officer/ Company secretary
January 2011- December2011	Coalition on violence against Women Responsibilities Advocacy Facilitating women empowerment programmes Strategizing and facilitating community forums Conducting client interviews Conducting legal aid clinics Report writing Facilitating legal training General office work Data collection Legal research
April-August 2008, May-August 2009	African Leadership And Reconciliation Ministries (ALARM) Responsibilities Research and report Writing General office work Adult literacy training Data collection Legal advice

May-June 2007
Responsibilities

Attachment at the Nairobi Law Courts
Proof reading of court documents
Taking notes in court
Analyzing court records
Legal drafting
Data collection
Legal analyses

SCHOLARLY ARTICLES WRITTEN

Environment law and Practice: what is the role of lawyers?

The right to work: Is Kenya complying with her International law obligations?

A tale of emerging rights: Is the right not to be poor legally tenable?

J.A.O v Home park Caterers: was the out of court settlement a lost opportunity to set a
Legal framework for AIDS in Kenya

The practicability of the Grand Coalition Government in Kenya

A case study of the International Criminal Court

HOBBIES & INTERESTS

- Strategic planning
- Research writing
- Interactive debating
- Making friends
- Traveling

REFEREES

1. CAROLINE MAPESA
WOMEN CO-ORDINATOR
AFRICAN LEADERSHIP AND RECONCILIATION
MINISTRIES (ALARM).
0721-389386

2. AGNES LEINA
PROGRAM MANAGER
COALITION ON VIOLENCE AGAINST WOMEN
0721-281859

Founder of PSECC & Kenyalight-Projects Ltd – Alan Brewer MSc.



Certificate of Attendance

This is to certify that

Alan Brewer
of
PSECC

attended the

**BRE Global Assessor Training Course on the
BREEAM Education Scheme**

On

Tuesday 14th-Thursday 16th October 2008

Date: Thursday 16th October 2008

Pauline Traetto
Training and Events Manager
BRE Global

breglobal



BRE Global Limited (incorporating LPCB) is an independent third party approvals body offering certification of fire, security and sustainability products and services to an international market.





Portsmouth City Council

Contact Mr Johnston
Our reference DJ/GAS/LA21
Your reference
Telephone 01705 834247

Fax
DX 19 October 1995

TO WHOM IT MAY CONCERN

RE: ALAN BREWER, MSc CANDIDATE, PORTSMOUTH UNIVERSITY 94-95
161 SYDENHAM COURT, BERKSHIRE CLOSE, FRATTON, PO1 1RQ

I confirm that Alan Brewer has been engaged on his MSc project "Sustainable Development in Local Authorities", full-time from early May 1995, until 13 October 1995.

Whilst engaged on this project he has also been assisting a City Council Team engaged on developing an Energy Policy and Strategy which forms an essential part of a Sustainable Development Strategy in Terms of Local Agenda 21. Alan has attended all meetings of this internal team which started on 12 April 1995 and has provided a positive knowledgeable contribution.

Furthermore, during this period he has also assisted me with other workgroups and Local Agenda 21 issues.

The City Council has benefitted from Alan's voluntary assistance and I, personally, have benefitted not only by his ready assistance but also from his expert knowledge of the full range of environmental issues embraced by Local Agenda 21.

I would have no hesitation in recommending Alan for any post in the sphere of environmental management and control.

Yours faithfully

D M R Johnston
Environmental Co-ordinator

Environmental Health Service

*Civic Offices
Guildhall Square
Portsmouth
PO1 2AZ*

Head of Environmental Health ■ Alan Higgins



**Hampshire
County Council**

Environment
The Castle, Winchester, Hampshire SO23 8UD
Telephone 01962 841841
Fax 01962 847055
Fax (abnormal loads) 01962 854045

Mr A Brewer
IMG Ltd & International Agenda 21 Ltd
Suite F9
Venture Tower,
Fratton Road, Portsmouth
PO1 5DL

Enquiries to	Heidi Hack	My reference:	
Direct Line	(01962) 847732	Your reference:	
Date	25 June 2002	E-mail	heidi.hack@hants.gov.uk

Dear Mr Brewer

INITIAL COORDINATOR FOR ENERGY NETWORK FOR NRI PROJECT

Thank you for your time in coming to Winchester and meeting with us on 6 June. As requested, I am confirming the outcome of that meeting in writing.

As you recall, we discussed the natural resources initiative which is currently being undertaken by Hampshire County Council. The NRI project aims to develop business practices and individual lifestyle changes that achieve the efficient use and conservation of natural resources. It aims to facilitate the development of a virtuous circle of production and consumption of goods being reused, recycled and reprocessed, minimising overall energy use.

An integral part of this process will be to work with existing networks and to develop new opportunities. At the meeting we discussed whether you would like to act as initial co-ordinator for the NRI energy network, pulling in the key players in the field under the NRI project.

If you have any further queries please do not hesitate to contact me on the above details.

Yours sincerely


for County Surveyor


Printed on 100%
recycled paper



2000-2007
Dealing with Waste

County Surveyor
John Ekins OBE FREng FICE
ALAN BREWER - 11 JUNE 2002



**Hampshire
County Council**

brie

*Property, Business and Regulatory Services
Three Minsters House
76 High Street, Winchester
Hampshire SO23 8UL
Telephone 01962 841841
Fax 01962 841326*

Alan J. Brewer
PSECC, Unit 1.2 Central Point
Kirpal Road
Portsmouth
PO3 6FH

Inquiries to Mike Fitch

My reference

Direct line 01962 847846

Your reference

Date Friday 16th May 2008

E-mail Mike.fitch@hants.gov.uk

Dear Alan

Re Sustainable School's Opportunities

Firstly, I would like to record my thanks to you and Kevin Ellis for the meeting yesterday to tell us about the work of PSECC.

I think it fair to say you raised with us considerable interest in the work that you are doing through PSECC and we would like to explore further how we might be able to work with your organisation and how PSECC can help Hampshire County Council with it's plans for reducing carbon emissions and contributing to the climate change agenda.

I agreed to let you have some background information about Hampshire County Council's property portfolio to assist you with your thinking about how our respective organisations might be able to connect.

In broad terms the County Council's property portfolio is comprised of some 7,000 buildings across 1,000 sites in Hampshire. The attached chart gives you an idea of the range of buildings that we manage, nearly 75% being schools. We are currently undertaking a major Strategic Property Review particularly around our office accommodation portfolio and new ways of working.

Hampshire County Council will become a CRC organisation from 2010 and I attach a report that I presented to Cabinet recently in this connection. The report provides detailed information about energy use and carbon dioxide emissions in respect of the County Council's property portfolio and street lighting obligations. You will see from the report that we have identified three Corporate work streams and these are now at development stage.

Once you have had an opportunity to consider the attached information I would appreciate receiving your comments about how you feel you can help with our Corporate work streams and Carbon Reduction Commitment (CRC).



BESTOR IN PEOPLE

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Acting Director of Property, Business and Regulatory
Karen Murray

The areas that seemed to us to be of most interest include;

- Sustainable energy in schools.
- Strategic energy company partnership
- Large scale biomass energy generation.

Alan, in covering the above issues it would be particularly helpful if you could explain how the funding arrangements for these strategic initiatives operate. This will be important for me to understand in relation to the impact on the County Council borrowing authority. Also, if you could share with us information of live projects that you have implemented elsewhere, I know that would be helpful in explaining to my colleagues how these initiatives might work in the County Council.

I look forward to hearing from you.

Yours sincerely



Mike Fitch
Head of Property Management

Enc.

cc. Steve Hall
Andrew Spencer



To whom it may concern

Reference Mr Alan Brewer

I was the Director of the Hampshire Natural Resources Initiative (HNRI) until I left the county in 2005. The HNRI was a public /private sector network of organisations that were working in the field on conservation of natural resources; materials, water, natural environment and the development of renewable energy.

Mr Brewer approached the HNRI representing a network of organisations that were interested in providing renewable solutions and with the potential to realise funding that would promote the development of renewable energy projects. At the time what was needed was someone to pull together those interested in this area and Mr Brewer was given this task.

Mr Brewer did present the HNRI with a report on ideas and opportunities for future development.

Whilst not involved as a Director or trustee of HNRI MR Brewer was active in this area and attended a number of meetings and offered a range of ideas.

The HNRI embedded into the county an approach to sustainability that has seen a number of results on all areas of its work.

Bob Lisney

Ex Director HNRI

18/11/11



Property Services

To whom it may concern

<i>Enquiries to</i>	Steve Hall	<i>My reference</i>	jsh211/dc
<i>Direct Line</i>	01962 847771	<i>Your reference</i>	-
<i>Date</i>	9 November 2011	<i>E-mail</i>	steve.hall@hants.gov.uk

Portsmouth Sustainable Energy and Climate Change Centre - PSECC

In 2008 the Property Services Department of Hampshire County Council met with Mr. Alan Brewer of PSECC to examine possible options for the development of sustainable energy sources in our school estate and our work on the Carbon Reduction Commitment.

PSECC produced a comprehensive report in September 2008 including setting out the national CO₂ reduction targets and potential technologies available, some of the initiatives already underway elsewhere in the country and citing a number of case studies for renewable energy as well as referencing existing projects in which the County Council was involved, such as the PUSH initiative.

The report also examined potential funding streams for the financing of renewable technologies and how the planning policies impacted on their deployment

Much of the information contained in the report was not specific to the County Council; however it did serve as a useful guide and did draw together many areas of work and initiatives running at that time.

More specifically, PSECC were involved with three Hampshire schools in obtaining funding for solar PV and wind turbine installations. However, as Property Services were involved only at 'arm's length' we cannot comment in detail as to the involvement PSECC had with the individual schools.

Yours faithfully

Steve Hall
Senior Engineering Manager

HCC Property Services, Three Minsters House, 76 High Street, Winchester, Hampshire, SO23 8UL
t: 01962 847778 | f: 01962 841326 | www.hants.gov.uk/propertyservices





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Telephone: Direct Dialling: 01252 361919
 DCSA DFTS: (9)4217 3919
 Facsimile: 01252 361954
 E-mail: richard.mortimer@de.mod.uk
 Internet Site: www.defence-estates.mod.uk



A.Brewer Esq
 International Agenda 21 Ltd
 39 Woodhay Walk
 Havant
 Hants
 PO9 5RD

Your Ref.

Our Ref.

Date. 29/11/05

Dear Alan

Re: Renewables Energy Initiatives

I refer to our meeting and your subsequent letter dated the 23rd November 05 where we discussed the promotion of the above through the eventual Aldershot Urban Extension marketing initiatives.

As mentioned at our meeting, I am personally supportive of your aims and aspirations and would be prepared to promote these initiatives to developers through the marketing material. You mentioned that your associates Marley Eternit Ltd, Vital Energi Ltd, IMGroup, PMSS and GE Wind would be prepared to speculatively design and cost waste management and renewable energy options which developers could consider for inclusion in their reserved matters applications. What MoD (as a public body) would need to be mindful of is not being seen to favour or promote your associates. Therefore you will appreciate that needs to be taken into account when preparing the information.

You also mentioned that there were grants available that could make the costs of using these alternatives competitive with traditional sources. I am confident that this information would incentivise developers to consider renewables. Perhaps we could liaise over the coming months so that an attractive and comprehensive package can be included for prospective purchasers of the site.

I look forward to working with you over the coming months.

Yours sincerely

Richard Mortimer





The Secretariat General, Government of South Sudan

3rd June 2006

Dear Sirs

RE:- Proposal for Joint Venture/Public Private Partnership with the Government of South Sudan – Environmental Sector

I am pleased to present to you Mr Alan Brewer as a senior representative for Grupo HLC in Africa.

Mr Brewer has authority to negotiate on behalf of HLC regarding the establishment of a partnership between HLC and the Government of South Sudan to undertake a range of environmental business from studies to strategy development, and the formation of a suitable vehicle to promote this.

Yours faithfully

H L Carvalho
Chairman



CC Vice President - Government of South Sudan,
The Minister for Environment,
The Minister for Industry & Mining,
The Minister for Legal Affairs and Constitutional Review,
The Governor of Jonglei State

Mark Jenkins, D.I. Jenkins & Associates/ HLC Africa

Sede / Head Office
HLC- Engenharia e Gestão de Projectos, SA
Edifício Escritórios de Monsanto
Rua do Alto do Montijo, Lotes 1 e 2 - Piso 4
2794-072 Carnaxide PORTUGAL
Tel +351 214 244 050 . Fax +351 214 244 051
Email: info@hlc-sa.pt
Contribuinte PT 501 689 672 . Capital Social 20.000.000,00
Euros
Cons. Reg. Com. de Cascais-Oeiras N° 8344

Reino Unido / United Kingdom
15, Berkeley Street - 4th Floor
London W1J 8DY . United Kingdom
Phone +44 (0)20 7629 9066
Fax +44 (0)20 7629 9117

Mr Alan Brewer
IM Group
22 Curd Ridge Close
Havant
Hants
PO9 5SG

Enquiries to	Campbell Williams	My reference	MRS Invite
Direct Line	01962 845661	Your reference	
Date	15 August 2003	E-mail	campbell.williams@hants.gov.uk

Dear Mr Brewer

Material Resources Strategy

I would like to invite you on behalf of Southampton City Council, Portsmouth City Council and Hampshire County Council to participate in the launch of the Material Resources Strategy for Hampshire. This is a unique opportunity to input into a major new environmental strategy.

The strategy will for the first time, provide integrated policy guidance on the management of materials throughout Hampshire from initial extraction, through all aspects of processing, use, re-use and recycling, to final disposal as waste. It will combine the Hampshire Minerals and Waste Development Framework (The Hampshire Minerals and Waste Development Framework under new legislation before Parliament replaces the Hampshire, Portsmouth and Southampton Minerals and Waste Local Plan, which is currently under review), The Project Integra Strategy, The Hampshire Household Waste Recycling Centre Strategy, and the Hampshire Natural Resources Initiative. Instead of running four separate consultation processes, there will be one integrated consultation, with opportunities for everyone to comment.

The strategy will be developed through stakeholder dialogue over the next year, with a target to complete one overarching strategy for Southampton, Portsmouth and Hampshire by Autumn 2004.

This consultation programme will begin at **Southampton Football Club, St Mary's Stadium on the 23rd September**, when we will present and begin discussion on the philosophy and the process of the Material Resources Strategy. These discussions will

then be broadened over the following year covering all the major issues and setting out the principles for managing material resources in Hampshire.

If you would be interested in attending this initial meeting please return the invitation attached to the HNRI team, at Hampshire County Council who are organising this event, or by replying by email on the contact details below. We will then be able to forward the working papers to you which will guide the discussions at this first meeting.

If you have any further questions please do not hesitate to contact Campbell Williams on 01962 845661 or campbell.williams@hants.gov.uk.

Yours sincerely



Keith B Estlin
Executive Member for Environment



- **SURVEYORS & ENVIRONMENTAL ENGINEERS** -
 39 CUCKOO HILL ROAD, PINNER, MIDDLESEX HA5 1AS, U.K.
 Tel.: + 44 (0)20 8866 0713 Fax: + 44 (0)20 8429 0959
 Email: sovereign@onetel.com

Contact: R. WERRY

Our Ref.: Alan Brewer

Your Ref.:

Date: 05.08.05

"FOR INTERESTED PARTIES"

Both, Alan Brewer and Sovereign C. S. Ltd., were some of the leaders and founder members of the Hampshire Natural Resources Initiative (HNRI) from over four years ago and Alan subsequently went on to co-ordinate the Energy Network and forming the "HNRI – Energy Consortium".

Over the years we have sought the expertise and knowledge of Alan to assist in the various "environmental projects" of Sovereign's activities, which primarily have been for projects in Asia and Africa. Some energy – as power focused, whilst the majority of our projects being in the reduction of energy by recycling and re-utilisation of waste including considering the energy content in the recycling process, thus "energy conscious" in the most holistic manner.

This has included searching for "environmental utilisation of waste" products and processes and when combined with new technology the application and integration of, and of particular note that in conjunction with SoilBind Ltd.'s polymers.

Alan has not only been a good team leader in our projects, but often with his knowledge and experience, over the period of February to June this year worked for us as "Environmental Consultant" taking charge of, leading and directing our various Energy and Waste projects.

Innovation and the ability to integrate new technologies in relation to the changing world (lifestyle, population demand trends and projections, climate etc.) the engineering challenge is like an insatiable desire and given the challenge from corn starck waste to contaminated animal bone waste he has come up trumps for us.

An enthusiastic, energetic, dedicated, committed Environmentalist" with an amiable, easy to work with reliable character sums up Alan, and his continued desire to "achieve" and apply environmental solutions is now seeking greater challenges in being able to see the results of his efforts, which due to political instability/finances some of the projects, which he was involved with us have been delayed and thus we are not able for him to stay with us.

We wish him well in his future career.

Roger Werry

Roger Werry
Managing Director



Nick Trew
Managing Director
Grosvenor Garden House
Grosvenor Gardens
London
SW1 OBS

Tel: 0207-8340088
Mbl: 07774-168688

11th July 2005

Reference: Alan Brewer MSc.Grad.MCIWM

To WHOM IT MAY CONCERN

Alan Brewer had worked for our company as the Environmental Business Development Manager from October 1998 to December 2004. The main areas of activity were in the Energy, Renewable Energy, Waste sectors and his initial coordination of the HNRI Energy Network and identification of Renewable Energy projects for Hampshire. As a result of this work Alan has been responsible for the first formation in Hampshire of a Farmers group for the growing of the Energy Crop Miscanthus to be used as a feedstock for a 3MWH Energy plant valued at £12 million.

Alan had written Integrated Waste Management Plant feasibility studies for us for the following cities: Moscow, Doha, Mumbai, Sofia, Edinburgh, Brighton, Hampshire and Winchester. These plants indicated a possible reduction of MSW to landfill by as much as 90% with EFW recovery.

He is capable of challenging established environmental practices and putting forward suggestions for change and communicating effectively via reports, emails and letters. Alan is a very capable Researcher and Analyst and has a strong capability of Facilitating groups for the delivery of Sustainable Development and the implementation of Project Management.

Alan principally worked from home and was always punctual for numerous meetings in London and his remuneration for his services was based upon a commission structure / rail & ticket fares.

International Mercantile Group Ltd were increasingly involved with infrastructure developments away from Alan's main area of expertise and for this reason Alan's position was terminated. Alan has a good character and nothing of a criminal nature is known.

I would recommend Mr Brewer for any Sustainable Energy, Climate Change or Waste position.

Nick Trew

A handwritten signature in blue ink, appearing to read 'N. Trew'.

Managing Director IMGroup



THE MOUNTBATTEN SCHOOL

DML/SWS

3 February 2010

To Whom it May Concern

Re: Alan Brewer PSECC

This is to confirm that The Mountbatten School now has a 9.72KW photo voltaic system installed, which cost a total of £53,304.39.

Alan Brewer of PSECC instigated the project for us, via the Ringwood sustainable schools cluster.

PSECC brought in Project delivery partners, namely SEi and British Gas – Solar Technologies, to install solar PV system. Alan advised on grants to provide total funding.

The system provides the school and wider community with a greater awareness of renewable energy. It lowers energy bills and reduces our CO₂ emissions by some 4 tonnes per year.

Alan Brewer of PSECC was critical in the success of this project – his knowledge and guidance proving invaluable.

Yours sincerely

D McDonnell (Mrs)
Deputy Headteacher

Whitenap Lane Romsey Hampshire S051 5SY

t: 01794 502 502 f: 01794 502 501 e: info@mountbatten.hants.sch.uk w: www.mountbatten.hants.sch.uk

Founder Patron: Earl Mountbatten of Burma

Headteacher: Heather McIntroy

Patron: The Lord Brabourne



R I N G W O O D
— SPECIALIST LANGUAGE COLLEGE —
Headteacher: Miss C E Edwards BA(Hons)

Ringwood School
Parsonage Barn Lane
Ringwood
Hampshire
BH24 1SE

Tel: 01425 475000
Fax: 01425 473063

Email: office@ringwood.hants.sch.uk
www.ringwood.hants.sch.uk

26th May 2010

To whom it may concern

Alan Brewer

This is to confirm that Alan Brewer of Portsmouth Sustainable Energy & Climate Change Centre, was the facilitator and responsible for the technology, consultancy and commitment, and funding arrangements for the recently installed solar PV at Ringwood School. He worked on the project with energy and enthusiasm, and without his help it is doubtful whether we would have obtained our 50% matched funding from British Gas complementing the initial funding provided by the Low Carbon Buildings Programme, Phase 2.

He has a real and deep-rooted commitment to the development and promotion of sustainable energy solutions in energy-hungry public buildings such as schools.

Gill Hickman
Head of Biology
Sustainability Coordinator
Ringwood School



UNIVERSITY of PORTSMOUTH



Alan John Brewer

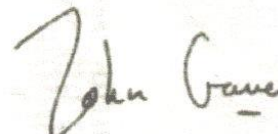
has been awarded the degree of

Master of Science in

ENVIRONMENTAL ENGINEERING

having followed a programme of study approved by Academic Council

3 June 1997


Vice-Chancellor


Academic Registrar



015604



Centre for Alternative Technology
Canolfan y Dechnoleg Amgen
Machynlleth, Powys, SY20 9AZ © www.cat.org.uk

courses@cat.org.uk

01854 705981

www.cat.org.uk/courses

CERTIFICATE OF APPRECIATION & COURSE ATTENDANCE

This certificate is awarded to

Alan Brewer

COMMUNITY RENEWABLE ENERGY SCHEMES

INTERNATIONAL AGENDA 21 LTD

Sustainable Development Renewable Energy

May 12_14_2006

UNIVERSITY of PORTSMOUTH



Alan John Brewer

has been awarded the degree of


Master of Science in

ENVIRONMENTAL ENGINEERING

having followed a programme of study approved by Academic Council

3 June 1997


Vice-Chancellor


Academic Registrar





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Mochynlleth, Powys, SY20 9AZ @ www.cat.org.uk

courses@cat.org.uk

01854 705981

www.cat.org.uk/courses

CERTIFICATE OF APPRECIATION & COURSE ATTENDANCE

This certificate is awarded to

Alan Brewer

COMMUNITY RENEWABLE ENERGY SCHEMES

INTERNATIONAL AGENDA 21 LTD

Sustainable Development Renewable Energy

May 12_14_2006

Certificate of Attendance

This is to certify that

Alan Brewer

of

PSECC

attended the

BRE Global Assessor Training Course on the
BREEAM Education Scheme

On

Tuesday 14th-Thursday 16th October 2008



Date: Thursday 16th October 2008

.....
Pauline Traetto
Training and Events Manager
BRE Global



BRE Global Limited (incorporating LPCB) is an independent third party approvals body offering certification of fire, security and sustainability products and services to an international market





The Chartered Institution of Wastes Management

This is to certify that

ALAN BREWER

attended and satisfactorily completed the

PRACTICAL WASTE MANAGEMENT TRAINING COURSE

held on **16th – 18th March 2004**

Chief Executive

Michael Philpott





INSTITUTE OF WASTES MANAGEMENT
Founded 1898 - Incorporated 1928

This is to Certify that

Alan J Brewer

was elected and admitted as an

Affiliate Member

on the 20th August 2001

In witness whereof the Seal of the Institute has been
affixed by the Resolution of the General Council



President *Cathy O'Brien*

Chief Executive *G. J. Higgins*

This certificate is issued by the authority of the Institute only, and not under, in pursuance of, or by virtue of any statutory or Government sanction or authority

Tel: 01752 232235
Our ref: JH/jd
Date: 5 September 2005



Student Registry

University of Plymouth
Drake Circus
Plymouth
Devon PL4 8AA
United Kingdom

tel +44 (0)1752 232 689
fax +44 (0)1752 232 141
www.plymouth.ac.uk

TO WHOM IT MAY CONCERN

This is to confirm that **Alan John BREWER** attended Plymouth Polytechnic (now the University of Plymouth) from September 1979 to July 1980 and on **4 July 1980** was awarded the **Certificate of Higher Education** having successfully completed stage one of the Bachelor of Science Degree in Environmental Sciences. This award was made by the **Council for National Academic Awards**.


.....
Jon Dawe
Awards Administrator

ORDINARY NATIONAL DIPLOMA

IN

SCIENCES

*Awarded jointly by the Royal Institute of Chemistry; the Institute of Physics;
the Institution of Metallurgists in liaison with other metallurgical interests;
the Institute of Biology; the Institute of Mathematics and its Applications;
the Institute of Medical Laboratory Sciences; the Department of Education
and Science and the Department of Education for Northern Ireland*



This is to certify that

ALAN JOHN BREWER

*has satisfactorily completed an approved Full-Time
or Sandwich Course in Sciences at*

HIGHBURY TECHNICAL COLLEGE, PORTSMOUTH

and passed externally assessed examinations in

MATHEMATICS
BIOLOGY
MAJOR CHEMISTRY
MAJOR PHYSICS
SCIENTIFIC TECHNIQUES

Under Secretary
Department of Education and Science

Permanent Secretary of the
Department of Education for Northern Ireland

Secretary for Welsh Education
Department of Education and Science

Chairman of the Joint Committee

1st August 1977

Title Deeds & Letters

REPUBLIC OF KENYA
OFFICE OF THE GOVERNOR
NAKURU COUNTY

Telephone: Nakuru 2214142
E-mail: nakurucounty.governor@gmail.com

OFFICE OF THE GOVERNOR
NAKURU COUNTY



When replying please quote

P.O. BOX 2870-20100
NAKURU.

Ref: CGN/RKR/RMM/2014/001

18th February 2014

Kenyalight project Ltd

Att. Joseph Mwai and Alan Brewer Msc 59th Floor,
parking complex, NHIF building, Ragat Road, Upper Hill,
Nairobi.

RE: AUTHORIZATION TO INTERACT AND EXPLORE IN SOLAR ENERGY.

Nakuru County have got great potential of solar energy especially in Naivasha, Rongai and Subukia areas where sunlight intensity is high.

Several companies have shown interest in partnering with Nakuru County in developing solar energy as this will go a long way with boosting the ambition of the ministry of energy in production of 6000 MW of energy.

We wish to invite your company to also explore along with others the most possible way of tapping this important resource.

Yours faithfully

RICHARD KIPSANG ROP

C.E.C – ENREW NAKURU COUNTY

Cc

H.E The Governor, OGW, GBS

Nakuru County

This County Authorisation letter for the Mai Mahiu in Nakuru County, this will be a Non-Tender Private Landowner Solar Farm development.

CHRISTINA GAKUHI KUBAI,
P.O BOX 601 NAIVASHA,
KENYA.
MOBILE NUMBER : +254(0)721291702
EMAIL : charleskubai14@gmail.com.

21st FEBRUARY 2014.

KENYA LIGHT,
TEL ; +254(0)717020125,
WWW.KENYALIGHT.UWCLUB.NET.
REGIONAL DIRECTORS.
ATT. MR. JOE MWAI & ALAN BREWER MSC

Dear Sir,

RE : SOLAR FARM – MAAAI – MAHIU, NAIVASHA, NAKURU COUNTY. L.R. KIJABE /
KIJABE/BLOCK 1/3242.

With reference to the above, and as per your willingness to invest and establish a solar farm in my land, in Maai -Mahiu, for a lease period of (20) twenty years, I wish to invite you for the same, subject to considerable offer.

Secondly. It is our own understanding that there will be a revenue sharing in a percentage to be negotiated between us.

The land in question is **L.R.KIJABE/KIJABE/BLOCK**

3242 – 27.38 HA – 67.77 Acres.

Please find here with attached copies of plan, title deeds and identity cards as proof of ownership.

As time is of essence, I call upon you to speed up the process since we have agreed with Mr. Joe Mwai (Your regional director) to halt any other use on this land.

In consideration of the same, I hope to hear from you soon.

I remain,

Yours Sincerely

C. G. Kubai

.....
CHRISTINA GAKUHI KUBAI
LAND OWNER.

CHARLES KIRAGU K. KUBAI
P.O BOX 601 NAIVASHA,
KENYA
MOBILE NUMBER- +254(0)721291702
EMAIL-charleskubai14@gmail.com
21ST FEBRUARY 2014

KENYA LIGHT

TEL: +254(0)717020125

WWW.KENYALIGHT.UWCLUB.NET

REGIONAL DIRECTORS

ATT. MR. JOE MWAI & ALAN BREWER MSC

Dear Sir,

RE: SOLAR FARM- MAAI-MAHIU, NAIVASHA, NAKURU COUNTY, L.R.
KIJABE/KIJABE/BLOCK1/3242/3245/3246/3249

With reference to the above, and as per your willingness to invest and establish a solar farm in my land, in Maai – Mahiu, for a lease period of (20) twenty years, I wish to invite you for the same, subject to a considerable offer.

Secondly, it is in our own understanding that there will be a revenue sharing in a percentage to be negotiated between us.

The land in question is L.R.KIJABE/KIJABE/BLOCK1/

3242 – 27.38 HA – 67.77 Acres

3245- 7.49 HA- 18.539604 Acres

3246 – 4.03 HA – 9.9752475 Acres

3249 – 2.02 HA – 5 Acres

TOTAL 40.92 HA – 101.29 Acres

Christina Gakuhi Kubai owning Block 1/3242:

the 67.77 Acres. We have a letter from her too.

Please find herewith attached copies of plan, title deeds and identity cards as proof of ownership.

As time is of essence, I call upon you to speed up the process since we have agreed with Mr. Joe Mwai (your regional director) to halt any other use on this land.

In consideration of the same, I hope to hear from you soon.

I remain,

Yours sincerely



CHARLES KIRAGU

LAND OWNER

*Amended on
28/4/94*

MINISTRY OF LANDS AND HOUSING

All correspondence should be addressed to:-

Provincial Surveyor,
Rift Valley Province,
P.O. Box 410, NAKURU

Telegram: "PROVIDSURVEY", NAKURU
Telephone: 4100

When replying please quote

Ref No. ACS/2/RVP/VOL.II/169
and date



SURVEY OF KENYA
PROVINCIAL SURVEYOR'S OFFICE
RIFT VALLEY PROVINCE
P.O. Box 410, NAKURU

.....15th July....., 1993.

The Land Registrar,
P.O. Box 1073,
NAKURU.

RE: COMPUTATION OF R.I.M. KIJABE/KIJABE(MAIMAHIU)
AREAS OF PARCELS NO. 3245, 3246, 3241, 1922, 1923

The R.I.M. computed areas of the above parcels is as follows:-

	<u>AREALISTS</u>	<u>COMPUTED AREAS</u>
1922	2.023 Hact	5.55 Hactares Appx.
1923	2.023 "	5.47 " "
3241	8.094 "	13.49 " "
3245	2.023 "	7.87 " "
3246	2.023 "	4.03 " "

Please amend your records to reflect the R.I.M. computed Areas. A part print is enclosed for your reference.

F. M. Angaya
(F. M. ANGAYA)
FOR: PROVINCIAL SURVEYOR, RVP.



REPUBLIC OF KENYA

THE REGISTERED LAND ACT
(Chapter 300)

Title Deed

Title Number KIJABE/KIJABE BLOCK 1/3242

Approximate Area 16.0 HECTARES

Registry Map Sheet No. 3

This is to certify that CHRISTINA GAKUHI KUBAI

(ID/5483399/68) P.O.Box 601, NAIVASHA

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 30 of the Registered Land Act as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the
NAKURU District Land Registry

this 23RD day of OCTOBER, 1992


Land Registrar





REPUBLIC OF KENYA

THE REGISTERED LAND ACT
(Chapter 300)

Title Deed

Title Number KIJABE/KIJABE BLOCK 1/5249

Approximate Area 2.02 HECTARES

Registry Map Sheet No. _____

This is to certify that CHARLES KIRAGU KAGOTHO (ID/1216084/E

P.O. Box 501, NAIYASBA

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 30 of the Registered Land Act as may for the time being subsist and affect the land.



GIVEN under my hand and the seal of the
NAKURU District Land Registry

this 25TH day of MARCH, 1992

Land Registrar



REPUBLIC OF KENYA

THE REGISTERED LAND ACT
(Chapter 300)

Land Certificate

TITLE NUMBER KIJABE/KIJABE BLOCK 1/3246

This is to certify that CHARLES KIRAGU KAGOTHO

(ID/ 1216084/64) P.O.Box 601, HAIYASHA

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 30 of the Registered Land Act as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the

NAIROBI District Land Registry

this 22ND day of MAY, 19 85




Land Registrar



REPUBLIC OF KENYA

THE REGISTERED LAND ACT
(Chapter 300)

Title Deed

Title Number KIJABO/KIJABO BLOCK 1/3245

Approximate Area 2.027 HECTARES

Registry Map Sheet No. 1

This is to certify that CHARLES NIBASHI KAGODHO

(ID/1216094/54) P.O. Box 501, MATUASHA

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 30 of the Registered Land Act as may for the time being subsist and affect the land.



GIVEN under my hand and the seal of the

KIJABO District Land Registry

this 20TH day of JUNE, 19 91


Land Registrar

Willows Holdings Ltd

P O Box 40474- 00100; Tel: +254 722610474

Our Ref: MPL 14.02.24

24th February, 2014

Joseph Mwai & Alan Brewer MSc

Regional Director for Kenya

5G 5th Floor, Parking Complex, NHIF Building, Ragati Road, Upper Hill,

Nairobi, Kenya

mobile number is +254(0) 717 020 125.

website www.kenyalight.uwdub.net

Dear Sirs,

RE: EXPRESSION OF INTEREST TO SETUP A 40MW SOLAR FARM IN NDEIYA

The above matter refers.

Willows possess more than 100 acres of land in Ndeiya and we invite Kenya Light to provide advice and services in relation to the master plan for the installation and transmission of 40MW solar power at the Ndeiya farm.

We therefore require Kenya Light to draft necessary documents for project compliance and setup and to ensure the solar farm is adequately financed and commissioned within the scheduled agreed timeline.

We would therefore be pleased if you would acknowledge receipt of this letter detailing the scope of the technical, administrative, operational and financial milestones envisaged to be achieved for the complete success of the Ndeiya Solar farm project.

Yours Faithfully,



Johnson Waweru
Director

COUNTY GOVERNMENT OF KAJIADO



TEL: 020-2043075

Fax: 0202043075/80

Email: kajiadogovernor@gmail.com

P. O. BOX 11
KAJIADO.

Date: 9th October, 2013.

OFFICE OF THE GOVERNOR

Our Ref: CGK/CEC-HOUSING/GEN.CORR/VOL.1/4

Kenyalights Projects Ltd.
(Att. Joe Mwai and Allan Brewer Msc.)
5G, Fifth Floor, Parking Complex, NHIF Building
Nairobi, Kenya.

RE: AUTHORIZATION TO INTERACT AND EXPLORE IN SOLAR ENERGY.

Kajiado County has great interest in the kenyalight project as per your presentation of 8th October, 2013.

We wish to welcome your company to explore areas of interest and potential within this County.

I hereby give you authorization to interact with the people of Kajiado North and Kajiado West as a starting point in order to obtain data for all the surveys required which in turn is useful in raising funds on behalf of the communities for the project.

I understand that the trial will be in 5 phases and phase 1 & 2 targets 500 homes to have solar PV kit systems.

We also wish that phase 3 & 4 will be developed and will give authorization to enable you raise project funding via your investors such as the **UNEP-REPP-First Mover project programme & Ilumexio.**

Yours sincerely



Dickson Ntikoisa
CEC-Roads, Public Works, Transport and Housing.

Cc. H.E The Governor



KIAMBU COUNTY GOVERNMENT
OFFICE OF THE COUNTY REPRESENTATIVE
NDEIYA WARD

Email:
ndeiyawardoffice@gmail.com
nelsonmbuiyu@yahoo.com

P.O BOX THIGIO,
LIMURU
Cell: 0720 985 323

OUR REF: 02/01/2014

DATE 31/01/2014

TO:
KENYALIGHTS PROJECTS LTD.
(Att: Joe Mwai & Allan Brewer, Msc)
5G, 5th Floor, Parking Complex, NHIF Building,
Nairobi, Kenya.

Dear sir/madam,

**RE: AUTHORISATION TO EXPLORE NATURAL RESOURCES IN
NDEIYA WARD**

Ndeiya Ward is located in Limuru constituency, Kiambu county 50kms from the capital city, Nairobi. Ndeiya is a semi-arid area covering 134km².

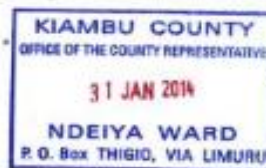
Our region has great interest in the Kenyalight project on the exploration of solar energy. We wish to welcome your company to explore and interact in your areas of interest and potential within Ndeiya. My office, by a copy of this letter gives you authorization to interact with the great people of Ndeiya as a starting point in order to obtain data for all the surveys required which will be useful in the commencement of the solar and wind energy project.

It is my sincere hope that this project will bring a massive impact in the lives of Ndeiya residents.

Regards,

Hon. Nelson Mungu Mbuiyu, M.C.A.

Ndeiya Ward



Country Data – Kenya Snap shot on Energy & Renewable Energy

- a) **“Resource Ownership”** - As Kenya develops its Renewable Energy market it is a good opportunity for the Country to use the concept whereby the Government could own, for example solar Farms and receive revenues from the Feed-In-Tariff and not the Developers. IEDL – Projects Ltd can provide all project funding requirements through other partners, possibly the South African funding partner identified by An EPC company.

The villages in Kenya can be transformed having Solar PV off Grid & Mini-grid systems - smallest systems are 10W - two lights and one phone charger. Larger systems are possible upto 130W for 240 V sockets for running fridges and TV and other commercial activities. The clans in the Provinces and Districts could actually “Own the Sun’s Resources”. “Resource Ownership” Concept in action..... each District could collectively receive revenues from the Feed-In-Tariff of Kenya for every KW generated from renewable energy schemes. One such scheme would be phase four of IEDL - 10MW Solar Farm for Ngong. This smaller Solar PV off Grid programme can be funded by the Local County Governments from their 3% share of any FIT from each Solar Farm.



Other possible locations in Kenya for Solar Farm

- b) Economics of Climate Change for Kenya - SEI report 2009

Study Overview

Kenya final main report: The Economics of Climate Change in Kenya. Executive Summary can be seen from the link on page button Economic Effects of Climate Change..

Future climate change will lead to additional and potentially very large economic costs. These are uncertain. However, aggregate models indicate additional net economic costs (on top of existing climate variability) could be equivalent to a loss of almost 3% of GDP each year by 2030 in Kenya.

An initial estimate of immediate needs for addressing current climate as well as preparing for future climate change for Kenya is \$500 million / year (for 2012). The cost of adaptation by 2030 will increase: an upper estimate of the cost is likely to be in the range of \$1 to 2 billion / year.

The continued annual burden of these events leads to large economic costs (possibly as much as \$0.5 billion per year, equivalent to around 2 % of GDP) and reduces long-term growth.

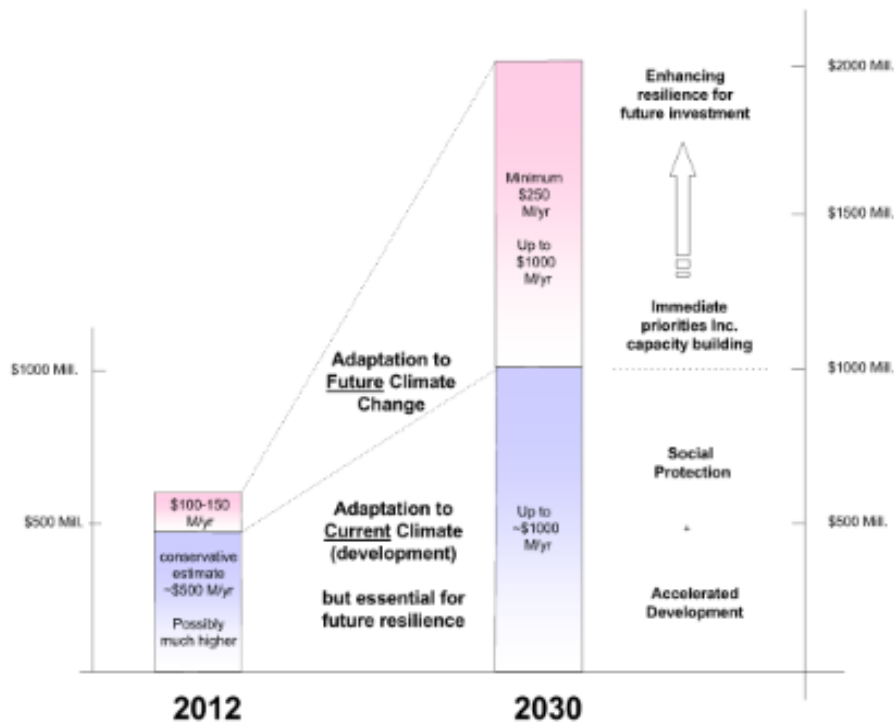


Figure 14. Indicative costs of adaptation to current and future climate in Kenya, \$ million/year

The study will use a multi-level approach that builds-up several lines of evidence on impacts and adaptation. It combines top-down sectorial economic assessment with bottom-up case studies on vulnerability and adaptation. These local studies allow consideration of livelihoods, development and poverty alleviation, which would otherwise be missed by a high level economic assessment. By doing so, local 'stories' are combined with more aggregated economic estimates, building a coherent message for policy makers.

Energy use and Profile of Kenya

Kenya, officially the Republic of Kenya, is a country in East Africa. Lying along the Indian Ocean to its southeast and at the equator, it is bordered by Somalia to the northeast, Ethiopia to the north, South Sudan to the northwest, Uganda to the west and Tanzania to the south. Lake Victoria is situated to the southwest, and is shared with Uganda and Tanzania. With its capital city in Nairobi, Kenya has numerous wildlife reserves containing thousands of animal species. It has a land area of 580,000 km and a population of nearly 39 million residents, representing many different peoples and cultures. The country is named after Mount Kenya, a significant landmark and second among Africa's highest mountain peaks. Kenya is a country of 47 districts, each with its own government semi-autonomous to the central government in the capital, Nairobi. The country's geography is as diverse as its people. It has a long coastline along the Indian Ocean and as you advance inland the landscape changes to savannah grasslands, arid and semi-arid bushes.

Energy sources

Total installed electricity capacity (2010): 1,429 MW

Total primary energy supply (2009): 18,723 ktoe

Comb. Renew. and Waste: 76.0%

Oil and Products: 16.5%

Geothermal/solar/wind: 6.2%

Hydro-electric: 1.0%

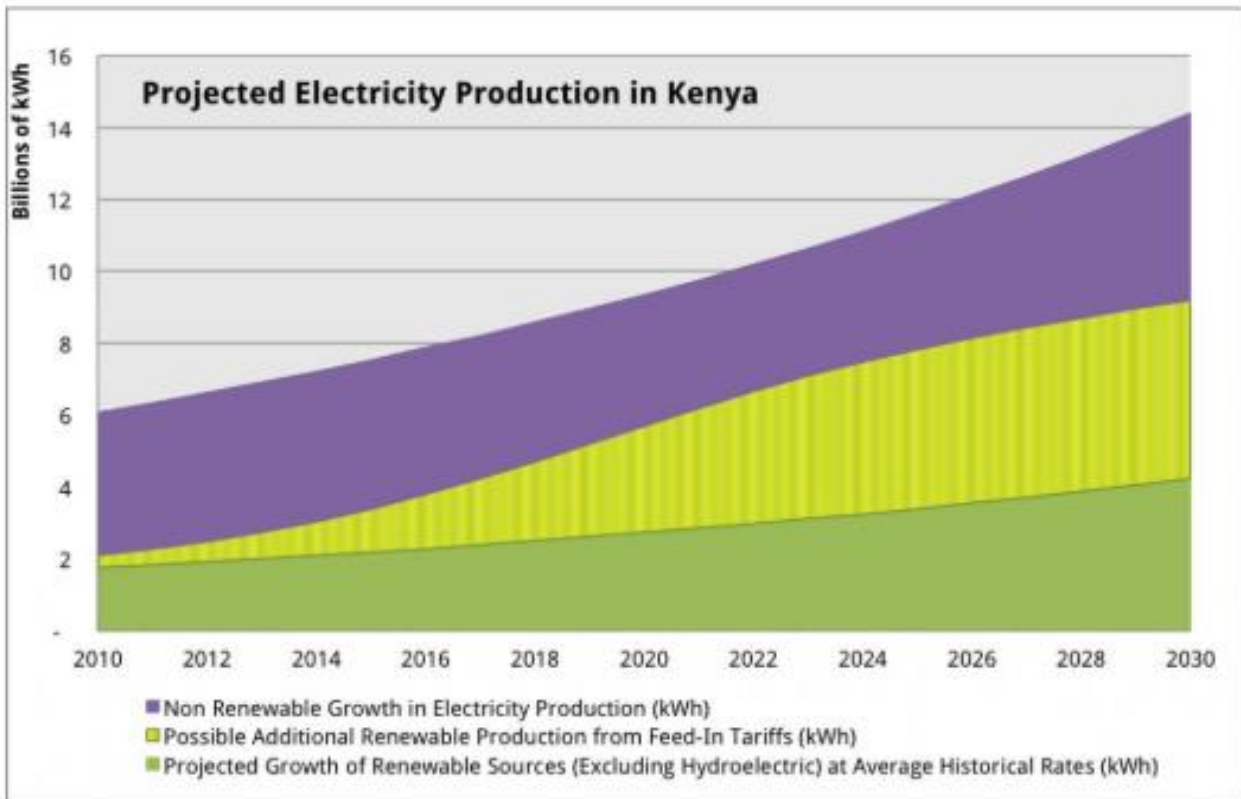
Coal: 0.3%

Hydro-electric: 52.1%

Conventional Thermal: 32.5%

Geothermal: 13.2%

Wind, Others: 2.2%



The largest share of Kenya's electricity supply comes from hydroelectric stations at dams along the upper Tana River, as well as the Turkwel George Dam in the west. A petroleum-fired plant on the coast, geothermal facilities at Olkaria (near Nairobi), and electricity imported from Uganda make up the rest of the supply.

Kenya's installed capacity stood at 1,142 MW a year between 2001 and 2003. The state-owned Kenya Electricity Generating Company (KenGen), established in 1997 under the name of Kenya Power Company, handles the generation of electricity, while the Kenya Power and Lighting Company (KPLC), which is slated for privatization, handles transmission and distribution. Shortfalls of electricity occur periodically, when drought reduces water flow. In 1997 and 2000, for example, drought prompted severe power rationing, with economically damaging 12-hour blackouts. Frequent outages, as well as high cost, remain serious obstacles to economic activity.

Tax and other concessions are planned to encourage investment in hydroelectricity and in Geothermal Energy, in which Kenya is a pioneer. The government plans to open two new power stations in 2008, Sondu Miriu (hydroelectric) and Olkaria IV (geothermal), but power demand growth is strong, and demand is still expected to outpace supply during periods of drought.

Kenya has recently found some hydrocarbon reserves on its semi-arid northern region of Turkana after several decades of intermittent exploration. Prospecting also continues off Kenya's shore. In the meantime, Kenya currently imports all crude petroleum requirements. Petroleum accounts for 20 to 25 percent of the national import bill. Kenya Petroleum Refineries—a 50:50 joint venture between the government and several oil majors—operates the country's sole oil refinery in Mombasa, which currently meets 60 percent of local demand for petroleum products. In 2004 oil consumption was estimated at 55,000 barrels (8,700 m³) a day. Most of the Mombasa refinery's production is transported via Kenya's Mombasa–Nairobi pipeline.

Energy Profile of Kenya

Kenya, officially the Republic of Kenya, is a country in East Africa. Lying along the Indian Ocean to its southeast and at the equator, it is bordered by Somalia to the northeast, Ethiopia to the north, South Sudan to the northwest, Uganda to the west and Tanzania to the south. Lake Victoria is situated to the southwest, and is shared with Uganda and Tanzania. With its capital city in Nairobi, Kenya has numerous wildlife reserves containing thousands of animal species. It has a land area of 580,000 km² and a population of nearly 39 million residents, representing many different peoples and cultures. The country is named after Mount Kenya, a significant landmark and second among Africa's highest mountain peaks. Kenya is a country of 47 districts, each with its own government semi-autonomous to the central government in the capital, Nairobi. The country's geography is as diverse as its people. It has a long coastline along the Indian Ocean and as you advance inland the landscape changes to savannah grasslands, arid and semi-arid bushes. The central regions and the western parts have ... read more [Source: dbpedia](#)

Reliance

Kenya relies heavily on imported petroleum for local consumption. In 2007, Kenya imported 57,000 bbl/day of crude oil. The primary energy supply is dominated by indigenous biomass use, which mainly supplies households and SMEs in the country. Biomass supply is currently viewed as unsustainable.

To address the energy crisis, Kenya has increased the import of electricity from Ethiopia, which offers cheap prices and, since 2009, has good hydro-electric sites.

Extend network

It is estimated that in Kenya 77% people do not have electricity connections.

Urban electrification level: 51%

Kenya's electricity mix is dominated by hydro generation (over 50%) and thus highly vulnerable to weather conditions and climate change. The climatic conditions of 1998-2000 and 2008-2009 curtailed hydropower generation and led to severe energy shortages which culminated into power rationing.

A weak transmission and distribution network, low countrywide electricity access and over-reliance on hydropower which is vulnerable to vagaries of weather, are some of the challenges facing the electricity sector. To address these challenges the Government has formulated strategies whose objectives are to rapidly expand installed electricity capacity, expand and upgrade the transmission and distribution networks, and develop renewable energy sources: geothermal, solar, wind, biomass and small hydropower.

Renewable energy

With average altitudes ranging from 1500m to 1700m, Kenya is rich in wind and solar energy resources.

Solar energy

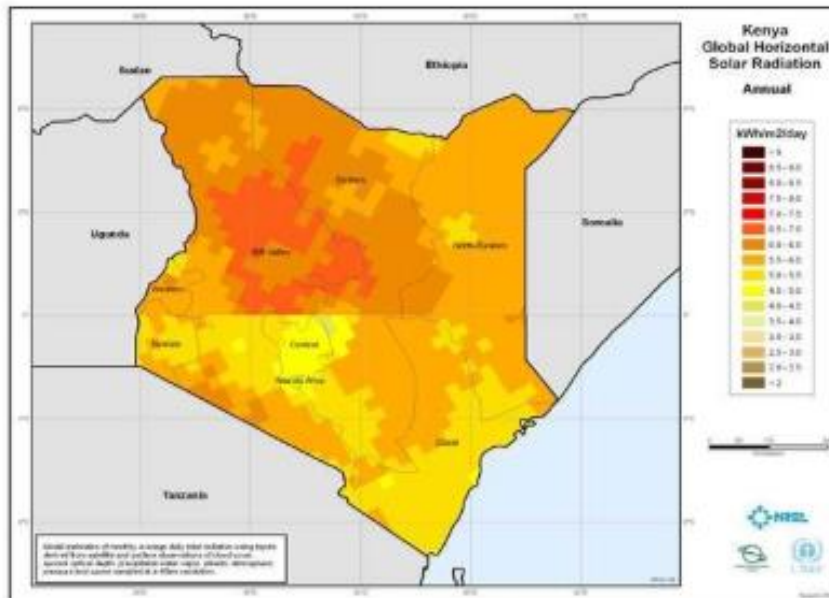
Kenya receives daily insolation of 4-6kWh/m². Solar utilization is mainly for photovoltaic systems (PVS), drying and water heating. The Solar PV systems are mainly for telecommunication, cathodic protection of pipelines, lighting and water pumping. Current installed capacity is approximately 4 MW. There are also approximately 140,000 solar water heating systems currently installed in the country.

Rural electrification level: 4%

Many urban and rural poor are not reached by grid-based electrical power, nor is there adequate distribution of gas or other cooking and heating fuels.

The national grid is operated as an integral network linked by a 220 kV and 132 kV transmission network. There is a limited length of 66 kV transmission lines.

Capacity concerns



In the Nairobi suburb Kibera, young Kenyans are producing small solar panels. These can generate enough electricity to operate a radio, and charge batteries or mobile phones. They sell them for \$US5, while the average income in Nairobi is around \$US1 a day. An estimated 100,000 solar home systems have been installed in Kenyan houses. The majority of these consist of a small 12-14 watt photovoltaic panel.

Ownership

Electricity market

Kenya Electricity Generating Company (KenGen, www.kengen.co.ke) is the leading electricity generator providing over 70% of the effective generating capacity to the national grid. The company is listed on the Nairobi Stock Exchange with 70% shareholding in Government and 30% private. Currently six independent power producers (IPPs) are operating in the country contributing approximately 30% of the effective generating capacity to the national grid.

Kenya Power and Lighting Company (KPLC, www.kplc.co.ke), is the national power utility responsible electricity distribution and supply. It purchases power in bulk from KenGen and IPPs currently in operation through Power Purchase Agreements approved by the Energy Regulatory Commission.

Kenya Electricity Transmission Company Ltd (KETRACO) is a corporation wholly owned by the Government and mandated to plan, design, construct, own, operate and maintain high-voltage (132kV and above) electricity transmission infrastructure that will form the backbone of the national transmission grid and regional interconnection.

Competition

There is some level of competition in electricity generation. KenGen generates over 70% of the country power output, and is in direct competition with six independent power producers, who between them produce about 30 percent of the country's electric power. KPLC has monopoly in the distribution and transmission of electricity in the country.

Despite the liberalization of the oil industry, there are only a few companies actively trading due to tariff and non-tariff barriers to entry.

Energy framework

Renewable energy development strategy is stipulated in the Least Cost Power Development Plan (LCPDP), Rural Electrification Master Plan, Sessional Paper No. 4 of 2004 (The energy policy document), the Energy Act of 2006, the Feed-in Tariff (FIT) Policy, the Kenya National Climate Change Response Strategy, Gender Audit of Energy Policies and Programmes in Kenya June 2007 and Kenya Vision 2030 (the National economic development blueprint).

The LCPDP envisions that Kenya's electricity peak demand will increase from 1,302 MW in 2011 to 15,026 MW by 2030, in line with the Vision 2030 which envisages energy as a key enabler for economic growth across the country. Accordingly, through the Rural Electrification Master Plan, the Government seeks to have 100% connectivity across the country through grid extensions and off-grid systems. To meet the increased electricity demand due to the enhanced economic activities various generation sources have been considered, targeting 5,110 MW from geothermal, 1,039 MW from hydro, 2,036 MW from wind, 3,615 MW from thermal, 2,000 MW from imports, 2,420 MW from coal and 3,000 MW from other sources. The investments required for generation, transmission and distribution to meet this demand are enormous. As one measure of mitigation and adaptation to climate change, the Government of Kenya has been spearheading promotion of development and use of alternative sources of energy by developing the National Climate change Response Strategy of 2010. Kenya is pursuing an energy mix that greatly emphasises carbon neutral energy sources such as geothermal, wind, solar and renewable biomass. In addition, the country's building codes are being reviewed to incorporate measures that will encourage climate proofing and the construction of energy efficient buildings.

The Kenya Vision 2030 is a long-term development strategy, which aims to create a globally competitive and prosperous economy with a high quality of life. It envisages that Kenya will be transformed into a newly-industrializing, middle-income country providing high quality life to all Kenyans in a clean and secure environment. Simultaneously, the strategy aspires to achieve the Millennium Development Goals (MDGs) for Kenya by 2015. Infrastructure, including energy, is identified as one of enablers of the envisaged socio-economic transformation of the economy with a vision to provide cost-effective, world class infrastructure facilities and services.

In keeping with the Millennium Development Goals, Kenya is committed to reducing by half the number of people who lack access to modern energy services by 2015 and reducing by half the number of people living in poverty. Access to affordable energy is an essential prerequisite to achieving economic growth and poverty reduction in Kenya. The majority of people who rely on biomass for thermal energy and who lack access to electricity are in rural areas; specifically, who cook with biomass or coal are almost universally women. The lack of access to affordable energy services - energy poverty- disproportionately affects women and girls due to their traditional roles, household responsibilities, and low socio-political status. The Government is expanding the access of electricity in rural areas through the rural

electrification programme covering both grid extension and off-grid systems. Furthermore the Government, in collaboration with development partners. Non-Governmental Organizations and the private sector, are promoting the growth of wood fuel as well as the efficient and sustainable use of biomass resources. The Government is also formulating a strategy to make the country kerosene free by substituting kerosene with renewable energy for lighting.

Under the Feed-in Tariff policy, a total of 2,050 MW of capacity from 47 separate projects (13 small hydro, 16 wind, 6 biomass, and 1 solar) have been approved for development. Five of these have finalised their feasibility study, and two power purchase agreements have been signed. The tariff itself varies depending on whether the power is firm or non-firm, and ranges from US\$ 0.06/kWh to US\$ 0.12/kWh, with a special rate of US\$ 0.85/kWh applied for geothermal power. These tariffs are secured for 20 years.

Energy procedure

The Climate Investment Funds (CIF) have approved funding for Kenya's investment plan to scale up and develop its renewable energy sources, which will enhance their energy security, increase electricity access, reduce supply costs and bring socioeconomic benefits to local communities.

It is expected that the US\$50 million grant will aid in catalysing private sector financing, decrease market risks and absorb many of the high start-up costs associated with renewable energy. The plan, which obtained funding through CIF's Scaling up Renewable Energy Program in Low Income Countries (SREP), was developed to overcome the economic, financial and technical barriers that have hindered Kenya in exploiting its solar, geothermal and wind resources. Kenya has also made a number of institutional and policy reforms, which will also assist in catalysing the market.

With the guidance of the African Development Bank (AfDB), Kenya is preparing to construct a geothermal plant that will provide 400 MW of a potential 1650MW by 2018. The project is the first to be solely developed by Kenya's newly established Geothermal Development Company, which will be primarily responsible for developing Kenya's geothermal resources. The power produced will be fed directly into Kenya's national grid. The SREP funding is also expected to fund capacity building initiatives. As part of the country's power development plan, a target of 300 MW of co-generation capacity by 2015 has been set, and as of 2011, 60 MW had been installed. In addition, a photovoltaic (PV) manufacturing facility was commissioned in 2011 in the country, producing PV modules ranging from 13 Wp to 125 Wp.

Energy regulator

Energy regulator

The Energy Regulatory Commission (ERC, <http://www.erc.go.ke>), which came into effect in July 2007, was formerly the Electricity Regulatory Board established under the Electric Power Act of 1997. The ERC is responsible for the economic and technical regulation of electric power, renewable energy and downstream petroleum sub-sectors.

Degree of independence

The chairperson of the ERC is appointed by the president. The Minister of Energy appoints the seven commissioners of the ERC. Independence of authority is listed as a core value of the Commission. Financing comes from government stipends and tariffs imposed on electricity, petroleum, and other sources.

Regulatory framework

The Sessional Paper No. 4 of 2004 and Energy Act of 2006 are the policy and legal frameworks for energy development in Kenya respectively. Through these, the Government is committed to promoting electricity generation from Renewable Energy Sources (RES). In addition, a Feed-in-Tariffs (FIT) Policy has been formulated to promote RES and improve the rating of Kenya renewable energy sector as an attractive destination for substantial private sector investment. Under the FIT system, investment security and market stability for investors in electricity generation from RES is provided whilst encouraging private investors to operate their power plants prudently and efficiently to maximize returns. This will facilitate the exploitation of the abundant RES available in the country. The FITs were introduced in 2008 and revised in 2010 to accommodate additional RES and review the tariff prices. The Government has zero-rated import duty and removed Value Added Tax (VAT) on renewable energy, equipment and accessories. The ERC has prepared Solar Water Heating Regulations. These steps are intended to mitigate the challenges faced in exploiting the solar energy resource.

Energy – a reminder of the current situation in Kenya

The largest share of Kenya's electricity supply comes from hydroelectric stations at dams along the upper Tana River, as well as the Turkwel George Dam in the west. A petroleum-fired plant on the coast, geothermal facilities at Olkaria (near Nairobi), and electricity imported from Uganda make up the rest of the supply. Kenya's installed capacity stood at 1,142 MW a year between 2001 and 2003. The state-owned Kenya Electricity Generating Company (KenGen), established in 1997 under the name of Kenya Power Company, handles the generation of electricity, while the Kenya Power and Lighting Company (KPLC), which is slated for privatization, handles transmission and distribution. Shortfalls of electricity occur periodically, when drought reduces water flow. In 1997 and 2000, for example, drought prompted severe power rationing, with economically damaging 12-hour blackouts. Frequent outages, as well as high cost, remain serious obstacles to economic activity. Tax and other concessions are planned to encourage investment in hydroelectricity and in Geothermal Energy, in which Kenya is a pioneer.

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Kenya has recently found some hydrocarbon reserves on its semi arid northern region of Turkana after several decades of intermittent exploration. Prospecting also continues off Kenya's shore. In the meantime, Kenya currently imports all crude petroleum requirements. Petroleum accounts for 20 to 25 percent of the national import bill. Kenya Petroleum Refineries—a 50:50 joint venture between the government and several oil majors—operates the country's sole oil refinery in Mombasa, which currently meets 60 percent of local demand for petroleum products. In 2004 oil consumption was estimated at 55,000 barrels (8,700 m³) a day. Most of the Mombasa refinery's production is transported via Kenya's Mombasa–Nairobi pipeline.

Electricity demand in the country is significantly rising mainly due to the accelerated productive investment and increasing population. Historically, energy demand is positively correlated with economic and population growth rates. Currently the electricity demand is 1,191 MW against an effective installed capacity of 1,429 MW under normal hydrology. This gives a reserve margin of 238 MW or 20% of demand. However during low hydrology, the reserve margin diminishes necessitating load shedding and procurement of expensive emergency power. The peak load is projected to grow to about 2,500MW by 2015 and 15,000 MW by 2030. To meet this demand, the projected installed capacity should increase gradually to 19,169 MW by 2030.

Over 85% of the population rely on traditional fuels such as wood, charcoal, dung, and agricultural residues for cooking and heating.

- Firewood remains the predominant fuel for cooking. Nationally 68.3% of all households use firewood as their main sources of cooking fuel. Over 80% of households in the rural areas rely on firewood for cooking compared to 10 percent of urban households.
- Charcoal is the second most popular type of cooking fuel used by 13.3% of households.
- Kerosene is ranked the third predominant cooking fuel, but is the most common type of fuel for cooking among 44.6% of urban dwellers.

Why Africa is Missing the Solar Power Boat

By Mark Hankins, Director, African Solar Designs – 3rd April 2013 3rd April 2013

Nairobi –“ Despite having one of the best solar regimes in the world, Africa is still a trivial player in the global solar market.

Less than 1.5 percent of the trade in solar came to Africa last year, and most of those solar panels were bound for South Africa.

That Africa has massive solar resources is no secret, this has been discussed since the 1980s. As well, it is not a secret that solar prices are at an all-time low — at less than US\$0.60/W. At the same time, electricity costs in Africa are among the highest in the world. And they are rising rapidly.

Clearly, the global age of solar energy is dawning. This leads one to ask “Why isn’t Africa at the centre of solar commerce?”

“Why are countries like the UK, with meagre resources that amount to less than a third of the equatorial blast of sun we enjoy here, installing more than the entire African continent?”

Going back less than 20 years, 99 percent of the PV business was off-grid. In 1995, when world production was only 80 MW/year, almost all solar systems provided power for applications far from power networks: remote telecomm sites, signalling sets and village schools and clinics. And, in the mid-90’s, over 20 percent of the world PV trade came to Africa.

However, in the mid-1990’s the green party in Germany succeeded in getting their Government to invest in support for on-grid solar power. In the U.S. and Germany, engineers developed inverters which enabled solar modules to synchronously feed their electricity into the grid. Within 10 years, a market was created that allowed customers on-grid to dispense with batteries, place modules on their roof, and power loads in their houses directly from solar arrays. Better yet, many customers spun their electricity meters backward and laughed at power companies while they fed power the other way. Interest in production of solar power on roof tops skyrocketed. Programs in Japan, Germany, Spain and California encouraged consumers to buy household and small business solar systems. By 2003, the solar industry, which has been growing at 20 percent per year for twenty five years passed the one gigawatt per year production mark. By 2012, 99 percent of PV business, now over 30 GW per year, was on-grid.

A huge transformation had taken place. The solar industry had gone from laboratory hobby of rocket scientists to off-grid hippie diversions to a mainstream investment, supported by feed in tariffs in more than 60 countries. But, in 2012, Africa was not a player in solar demand. Why? Because solar in developed countries is on-grid and in the hands of the middle class. As grid demand grows, demand for solar grows. But solar in Africa is off-grid. It charges batteries and is, predominately, in the hands of lower income groups. As the grid expands, the market for solar contracts.

Barriers to Development

Africa has been slow to invest in all renewables. According to Bloomberg New Energy Finance, of \$268.7 billion invested worldwide in renewable energy last year, only about \$4.3 billion was made in Africa — and most of this went to South Africa and north Africa. But it has been particularly slow to join the solar PV party.

There has never been a conspiracy to keep solar out of Africa. Instead, a set of factors has led to a market failure that keeps solar off Africa’s grids. The inability to connect and market solar “on to the grid” has kept major solar companies out of Africa and has made solar a tool with limited markets, an expensive choice for rural people without cash, often peddled with missionary zeal by aid agencies and NGOs. Among rural people who get by on a few dollars a day, off-grid solar will always be limited — a plaything that cannot deliver what grid or generator power can, something in a shop window, or a toy that provides a few watt hours a day, but not a permanent solution.

The first major blockage to the development of African’s solar sector has been political. As is still the case in much of the developed world, actors who think “big” manage electricity sectors from Capetown to Cairo. Centralized power from large coal, hydro and petroleum plants has been the order of the day for decades among African power companies, and they are always planning large projects to overcome many obstacles they must deal with. Small, decentralized PV power projects do not easily fit into their programs. In developing big fixes to solve short-term problems, solar PV is overlooked in favour of crisis management. When the hundred million dollar focus is on expanding the grid to the whole country, off-grid solar does not play well among bureaucrats or politicians. Secondly, Africa’s policy makers have been among the last in the world to adopt the message of decentralized power. Even though end consumers, adapting to regular power

outages, are forced to utilize decentralized diesel generators all over the continent, ignorance and inertia at policy levels have kept new solutions from gaining a foothold. Policy makers, often stuck in crisis-prevention mode on a day-to-day basis, haven't looked forward to use of solar power. They have not had the time or support to create the policies, regulations and incentives necessary to start the transformation of power sectors to new sources. Often, they are simply unaware of the real transformative potential of solar energy for their countries. And, unlike Europe and the U.S., there have been few "champions" for solar among Africa's government and private sector.

Thirdly, it is impossible to ignore the entrenched interests that actively seek to maintain the status quo. In much of East and West Africa, electricity sector power is increasingly produced by diesel-powered thermal generators. Diesel generation is extremely expensive for consumers, but it is lucrative business for the well-connected moguls that have the supply. Even if solar were cheaper (and it is lower cost than diesel generation from \$100/barrel petroleum!), what business interest would the powerful elite have in replacing their generators with customer-owned solar?

Finance is another key problem. Unlike Germany, there is a comparative lack of middle class to invest in solar PV systems (though commercial classes invest heavily in generators). Banks and financiers are uneducated about renewables and they tend to be ultra-conservative. The long payback periods, small size and the lack of established business models make solar PV a foreign language to the finance community. Instead, they chase more lucrative large-scale power projects.

High interest rates mitigate heavily against solar PV – when banks want upwards of 20 percent interest on home loans, no maths anywhere can make a loan for a PV system a smart move. Neither has the aid community helped build the real solar energy sectors seen elsewhere. While a multi-billion dollar solar "party" rages in the north, and in places such as UK, Germany, California and Italy potential solar buyers have access to subsidies, feed-in tariffs, tax holidays and low interest loans, in Africa solar is for the poor. Since Rio in 1992, for Africa renewables have been about energy access for off-grid communities. Donor investments from groups like the Global Environment Facility and bilateral agencies have been to increase energy access with renewables. The message is paradoxical – in Europe, solar is for the green-minded middle class and rich. In Africa, solar is for disenfranchised communities in distant off-grid counties.

To a city-based middle class African, the array of off-grid solar powered lighting gadgets, often marketed by well-meaning and well-funded "social entrepreneurs" look a lot like toys. Yes, perhaps something to take home to the village over Christmas, but not something that would be of interest to a city-based African.

And here's the rub: even though today, most Africans have limited access to electricity – 70 percent or more of all Africa – the people that are starting businesses, creating opportunities, growing economies and using the bulk of the country's generated power are the urban middle classes. So, while donors and social entrepreneurs smugly trundle renewables to distant rural communities, in the big towns electricity is increasing unsustainable and dirty. The very city-based NGO workers and aid agencies that speak of green and clean energy for the poor, sit in CO2 spewing traffic jams and use hundreds of times more power than their pico-solar gadgets can generate

So, while no one can legitimately criticize the intentions of aid-focused attempts to help replace the poor person's kerosene burden, there is a glaring fallacy in the rhetoric. Where is the power for the NGO office computers coming from, and where is the power that runs the town coming from? In the big picture, a day in the dirty-energy life of Nairobi discharges more emissions than a week in a hundred rural communities.

The point of this article is not to bash the use of solar energy for rural access. It is a vital part of rural electrification in many countries. It changes lives. It has also been the starting point for solar industries. However, off-grid solar power is a dead end. Asking major solar companies to get involved in pico-and small-scale solar work is like asking automobile manufacturers to get involved in bicycle production and marketing. It will not happen – the products are very different.

c) How We Can Move Solar Forward

If Africa wants to attract more investment in solar, it has to increase solar demand twenty fold. And this will only occur when, as has happened everywhere else, programs are developed to bring solar on-grid and to greatly increase demand for solar.

First we need to change the ownership of the energy discussion. It is not about poor people's energy access — it is about green power period. In the same way that Biko's Black Consciousness movement preceded real moves to Black

Empowerment, there must be a Green Consciousness movement in Africa to push for environmentally-sound energy strategies. Whether the big-power, petroleum and coal-fuelled status quo is kept in place by ignorance, inertia or greed, it will not step aside voluntarily. As was the case in the US and Europe, neither will old interests leave the corridors of power in Africa. A green-minded civil society must demand mainstream green power in Africa.

This is not something that will be given to Africa by donor agencies, social entrepreneurs or missionaries. It is something that Africans themselves must achieve through discourse and political struggle.

It will be the educated middle classes — not the rural poor — that help consolidate moves to greener energy. They are the ones that are using resources, investing, deciding the direction that the country moves in. Sure, in a real democracy there are many voices, but ask yourself how many of the million solar systems in Germany are owned by poor people. Companies that sell solar in Africa need to act like "real" companies and recognize that the rapidly growing urban middle class is a viable market. They use electricity, they are keen, they would like to be green and they would like to be empowered. This is a growing market that requires investment — and policy framework — to open up.

Secondly, there is a need to do the hard work of re-writing policies, framing enabling environments, drafting regulations and building up capacities of companies to manage the use of solar energy. Whereas energy access for the poor often requires small artisanal businesses, large solar projects require engineers, financiers and even lawyers.

Finally, there is a need to re-think how local and international incentives can build solar markets. It is a complicated discussion. The question of energy access will remain central — because providing access to those without power is about political equity and a problem to be resolved. But at the same time, solar energy sectors must be built — in the same way electricity sectors have been built in the past through large investments in dams, coal stations, geothermal wells and transmission infrastructure. Solar must have its place at the table, with all of the other important generation technologies. We are, slowly, getting there. South Africa is now installing hundreds of megawatts of solar PV capacity. Kenya is developing grid connected regulations, and will have more than a dozen net-metered grid-connect systems by the end of 2013. Tanzania, Ghana, Cape Verde, Botswana, Namibia and Uganda all have ambitious plans for solar. But there is so much more to do!

Source: (Mark Hankins – Renewable Energy World – 3rd April 2013 - has worked in as a trainer, project manager and advocate for solar in Africa for over 20 years.)

Expected Benefits

The advantages of this policy include: a) environmental integrity including the reduction of greenhouse gas emissions; b) enhancing energy supply security, reducing the country's dependence on imported fuels; and coping with the global scarcity of fossil fuels and its attendant price volatility; and c) enhancing economic competitiveness and job creation. Initially covering wind, biomass and small hydro, the policy is planned to be to include geothermal sources of energy.

It is expected that the FIT policy in Kenya could stimulate about 1300 MW of electricity generation capacity. If the projected generation capacity is realized, this could contribute significantly to ensuring security of electricity supply in the country by increasing the reserve margin. Furthermore, since the resources used consist of relatively low-cost local fuels, it is likely to reduce costs for the consumer. Benefits targeted are a "triple-win" of additional renewables-based generation capacity to the country; enhancing employment and poverty alleviation in the rural areas; and increasing income opportunities for business development.

As Kenya's greatest renewable energy potential is in rural areas, the effects of the feed-in tariff policy are expected to trickle down and stimulate rural employment. This can happen through the construction of power plants, but also in the context of agro-industries, in particular sugarcane, which is predominant in the country. It is estimated that the sugar

factories have directly and indirectly contributed to job creation by supporting about 200,000 small-scale farmers within the sugar belt in western Kenya, and that between five and six million people either directly or indirectly benefit from the sugar factories.

Source:

1. Kenya Ministry of Energy, Feed-in-tariffs Policy on Wind, Biomass and Small-hydro Resource Generated Electricity, March 2008.
2. Kenya Ministry of Energy, Feed-in-tariffs Policy on Wind, Biomass, Small-hydro, Geothermal, Biogas, and Solar Resource Generated Electricity, 1st Revision, January 2010.
3. AFREPREN/FWD Energy, Environment and Development Network for Africa, The Role of Feed-in Tariff Policy in Renewable Energy Development in Developing Countries, September 2009.

Anticipated Effects: Benefits and Growth of Renewable Energy

The most obvious benefit of the feed-in tariff is the potential for added capacity for renewables. As outlined above, the maximum capacity that the feed-in tariff will subsidize is 1750 MW added over the course of 20 years. According to UNEP, it is reasonable to expect that the feed-in tariffs will stimulate 1300 MW of installed power capacity.

Taking into account the diversification of the renewable energy sources and their respective global efficiencies, we estimate that this results in a potential additional 5800 GWh produced over the duration of the tariff.

Historically, overall electricity production has increased on average at 5% per year; this is shown in purple. Production from renewables, excluding hydroelectric has historically increased at 4.5%. The yellow area in the chart below shows the potential additional renewable production that would come as a direct result of feed-in tariff projects they could almost double renewable energy production.

What's intriguing is the way that the feed-in tariffs will affect Kenya's energy mix. We don't expect that feed-in tariffs will accelerate overall growth, as historically the nation's energy growth has been consistent due to careful management and diversification of its sources. If the overall energy production continues to grow consistently and an additional 1300 MW of renewable energy capacity is installed as predicted through the feed-in tariff program, energy production from renewable could make up to 60% of national energy supply. This would certainly put Kenya on the forefront of energy development in Africa.

The government's efforts at creating a comprehensive policy will create many fringe benefits including stimulating investment and reducing the cost of peak electricity. The tariff makes renewable energy generators more attractive to potential investors thanks to the guaranteed 20-year purchase contract (PPA) at a fixed price per kWh. Additionally, feed-in tariffs have historically reduced the price of peak electricity when deployed in other markets. According to Clean Technica, peak energy prices in Germany decreased by 40% and the savings were passed onto consumers. Although this spells lower average revenue per person to the national energy suppliers (there is one state-owned and six independent providers in Kenya), reducing the price is the only way to increase the customer base in emerging markets.

The policy tools in place will allow renewables to play a significant role in closing the energy gap in Kenya and will create opportunities for entrepreneurs and investors alike. Not only is the government specifically stimulating innovation in renewable energy, it is also helping to facilitate entrepreneurship across all sectors, attract investment, and potentially double renewable energy supply. After seeing the potential increase as a result of the feed-in tariffs and understanding the fringe benefits, we're optimistic that Kenya will be a leader in African energy innovation.

Source - European Investment Bank REPP