

# **Kipeto Wind Farm**



## **ESIA Supplementary Report**

### **September 2014**



**Kipeto Energy Ltd.**

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## **2014 Kipeto Wind Farm Supplementary**

### **1.0 Introduction**

Kipeto Energy Ltd proposes to establish a commercial wind energy facility by constructing 60 GE 1.7 103 wind turbine generators within an area of about 70km<sup>2</sup>, with a maximum generating capacity of 100 MW. The Kipeto area is located about 70 km south-west of Nairobi in Kajiado County, dominated by the Maasai people approximately 18km north-west of Kajiado town in the Rift Valley Province. The main activities of the project include a turbine corridor of 60 wind turbines, internal access roads to all turbines, and a 17km transmission line to the main Nairobi Namanga road on a 30 metre wayleave.

The proposed project will be undertaken in the Esilanke area, Oloiyangani (Kipeto) sub-location, south Keekonyokei location in Kiserian, Kajiado division. The proposed wind farm will be developed on land leased from local landowners.

Kipeto Energy Limited is a special purpose vehicle incorporated in Kenya, to develop the proposed 100MW wind energy facility (“Project”). The shareholders of the Project are: African Infrastructure Investment Fund 2 (55%), who took over the rights to equity from General Electric International, International Finance Corporation (20%) and Craftskills Wind Energy International Limited (20%), a Kenyan, based renewable energy developer. Kipeto Energy Limited will allocate 5% of the profits arising from power generation to the local Maasai community, and a broad community engagement process will be undertaken to ensure this is managed and spent according to the community wishes via a community trust. Details of the community trust are outlined later in this document.

A supplementary report was issued in October 2013 to supplement the original ESIA submitted to NEMA in March 2012 due to changes to the layout, further studies carried out and requirements of international standards such as IFC and OPIC due diligence requirements. This report is intended to update the report issued in October 2013. Since Oct 2013 the layout has been revised from 63 no. GE 1.6 MW 100 turbines to 60 no. GE 1.7 MW 103 turbines.

### **1.1 Kipeto Wind Farm Layout Changes**

The proposed wind farm will be developed on land leased from local land owners. The wind turbines will be sited over a project area measuring approximately 70km<sup>2</sup>. The original layout

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submitted to NEMA consisted of 67 no. turbines. The application was for a 100MW Wind Farm. The wind farm was revised in October 2013 to comprise of 63 no. 1.6 MW 100 GE turbines. Following discussions to optimise the layout and take advantage of advances in turbine technology, it was decided to further revise the layout in August 2014 to 60 no. GE 1.7 MW 103 turbines. Following an extensive analysis, it was determined that the the GE 1.7 MW 103 turbine model was the most suitable turbine for this site. 60 no. GE 1.7 MW 103 turbines were chosen on the basis of:

- Optimum yield
- Meeting environmental constraints such as
  - Noise impact less than 43dB(A) or in the case of landowners involved with the Project less than 45dB(A)
  - Outside a radius of 500m of any *Osyris Lanceolata* (East African Sandalwood) establishment
  - Away from the riverine areas that support sensitive habitats
  - Construction compound at least 100m from water bodies

The proposed changes can be seen in Appendix 1 Revised Layout September 2014. The yellow line denotes the 2013 layout and the green line the cable route of the proposed layout and thus the current layout. It has been necessary to change the numbering system of the layout between the 2013 and 2014 but the turbine no. and year are shown. The changes are as follows

- T1, T2 and T3 are moved within 20m.
- T6 (2013) has been moved from the north to the south of the site and is now T41.

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The proposed development is for a wind farm consisting of 60 no. GE 1.7MW 103 turbines and all associated development. The dimensions of the proposed turbines as compared to the previously proposed GE 1.6MW 100 are:

	1.7 MW 103	1.6 MW 100
Hub Height (m)	80	80
Blade Length (m)	51.5	50
Rotor Diameter (m)	103	100
Overall Height not exceeding (m)	131.5	130

A receptor survey was conducted in order to quantify the number of properties within 1.03km (10 rotor diameters) of the proposed turbines. In total, 62 receptors were found. Noise and shadow flicker impact assessments were conducted on these receptors. Please refer to section 3 of this report.

### Note: Classification of the Maasai Population

IFC E&S specialists have confirmed that they would be aligned with OPIC on the classification of the Maasai population. Although they do not share OPIC's views on the classification of Maasai as an indigenous people, they agreed to rank Kipeto as a category A project.

## 2.0 Documentation

The documentation connected with this report is comprised as follows:

- Sept 2014 Kipeto Wind Farm and Transmission Line Supplementary Report
- Appendices
  1. Revised Layout
  2. Noise Impact Assessment
  3. Shadow Flicker Impact Assessment

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### **3.0 Revised Impact Assessments (60 no. GE 1.7 103 Layout)**

#### **Birds**

As the number of turbines is reduced from 67 to 60, it is not anticipated that there will be any changes to the bird and bat assessments from October 2013 or the original assessments. All turbines have remained in the same position with movement of up to 20m only with 3 turbines dropped from the original layout. The turbines have increased by 1.5m in height only. It is not anticipated that this will cause variations in the original bird and bat studies.

Despite Kipeto being a point of migration within the greater Rift Valley, densities of migrating birds in the study area is low. Additionally, only a small fraction of the site is exposed to turbines. Birds may behave differently once turbines are erected; subsequently, post construction monitoring will need to be undertaken to provide additional information on avian behavior. New wind installations must be followed by detailed behavioral observation of soaring birds as well as further mapping of migration routes to establish any changes in bird behavior and movements during the post construction studies.

#### **Bats**

The bats documented in the area of the Wind Farm and Transmission line are not of critical conservation concern, nationally or regionally. None are either IUCN listed as threatened or known to be endemic, hence the overall remark that Kipeto-Isinya area is a moderate bat conservation.

Due to paucity in our knowledge on how local bat species including suspected migratory ones, could be affected by wind turbines and power lines, a monitoring plan has previously been strongly recommended during operations. The monitoring plan should be integrated within the construction and operational plans.

#### **Ecology**

The number of turbines is reduced from 67 to 60 with an increase in height only of 1.5m which is insignificant in terms of ecological impact. Some turbines were moved by up to 20 m only which will not result in any changes to the ecological resource once the conditions of the NEMA

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license are adhered to. The findings of the ecological impacts previously outlined previously still stand.

### Noise

There are 62 households located within 1.03km of a proposed turbine (10 rotor diameters). To predict the noise generated at these properties, noise modeling was conducted using WindPRO software, version 2.8.579. Please refer to Appendix 2 for detailed results of the prediction model.

Noise levels for 62 households in the vicinity of the site were predicted for this wind speed. The results are re-produced in Appendix 1. It should be noted that these predictions represent downwind propagation in all directions, which clearly cannot happen at all locations simultaneously.

The lower fixed noise level limit is 43dB  $L_{A90}$  for non-involved houses and the lower fixed noise level limit for involved houses is 45dB  $L_{A90}$ .

The predicted noise levels lie within the adopted criteria in all cases. The noise impact of the wind farm is considered acceptable. It should be noted that the noise contours for the revised turbine type the GE 1.7MW 103 are the same as for the GE 1.6 MW 100 if serrated blades are used.

### Shadow Flicker

The Shadow Flicker impact Assessment for the Kipeto Wind Farm Layout has been updated following the revision of the layout using *WindPRO version 2.8.579*. Please refer to the **Appendix 3** for a detailed analysis.

The analysis found that 1 household within 10 rotor diameters of a proposed turbine will exceed the guidance of 30 hours maximum per annum. However this household is a landowner in the project. The shadow flicker analysis was carried out with the assumption of a “green house model” whereby the model assumes that the entire house is made from glass i.e. the entire house is a receptor. In reality the location of the windows of the house are the receptors and need to be imputed into the model to ascertain the exact level of shadow flicker that will occur. In the unlikely event that shadow flicker should exceed 30 hours per annum at a particular receptor the

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operation of the turbine can be curtailed to avoid this. This technical solution is standard practice at many wind farms throughout the world.

## **4.0 Community Engagement, Community Trust, Land and Legal Issues**

### **Land Agreements**

The status of land leases, wayleaves and house movement agreements is as follows at time of compilations of this report (12/09/2014)

- Land leases fully processed,- 56
- Land Leases outstanding - 3
- Wayleaves fully processed-15
- Wayleaves outstanding-12
- HMA's fully processed-15
- HMA's outstanding-0

### **Household Movements**

There are approximately 83 no. numbers of households on 16 plots comprising of a number of individuals to be relocated. The resettlement for all project components is voluntary in nature and that the Project cannot resort to any legal means or expropriation of the plots in question. On this basis a RAP is not required. The exact number of individuals is unknown. The household members have been given assurances that this process is voluntary. Where agreement has been reached the household has been shown design of dwellings to be provided drawn by a local firm of architects and had input into the designs. In many cases where requested bomas for livestock are also provided

All members of the households were engaged where possible in discussion when the relocation of the house was agreed and were involved in design of the new property. However in Maasai culture typically decisions are made by the head of household as is common in many patriarchal cultures globally. Each design was subject to discussion with the household. The final design is based on the requirements of each household. Each household head has signed an agreement to

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move on condition that a new home will be built for each household as per the architects drawings attached to each house movement agreement

It should be noted that the process of negotiation took place over many meetings between the local partner's, Craftskills, and the community liaison officers, with access to legal advice provided.

The relocation process will be the responsibility of the local liaison officers and Kipeto SPV, along with local contractors. It is likely that the process will commence after financial close, at the start of the construction phase. The final timing of the process is subject to planning with the EPC contractor. A community liaison office will be on site in the next few weeks. The grievance procedure process will be used to monitor and evaluate the success of the relocation. The relocation process will be discussed weekly at the operational call. Kurrent Technology is in the process of drawing up a proposal to implement a grievance procedure process.

## **Extension of User**

KEL applied for an extension of user from the land control board. Approval from the Land Control Board has been obtained and the application is now awaiting final approval from the National Land Commission. A decision is expected in the coming weeks.

## **Building Permit Application**

A building permit application for the proposed wind farm, the associated transmission line and ancillary works has been lodged with Kajiado council in September 2014. The process is expected to take 6 weeks until approval is obtained.

## **Community Engagement**

Community engagement has continued with the local partners Craftskills maintaining regular visits on site.

The following is a list of meetings held on site since Sept 2013. Minutes of these meeting have can be found in Appendix 4.

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- Voluntary house movement meeting 12-9-2013
- Transmission line landowner meeting 30-11-2013
- Transmission line landowner meeting 28-06-2014
- Landowners meeting 18-07-2014
- Youth meeting 30-08-2014

2 community liaison officers from the local community are charged with dealing with the local population and keeping the project partners informed of concerns of the local community.

A community liaison office will be placed on site in the market place by the end of September 2014. The office will be manned on a daily basis and will provide information, project updates and will serve as a central point for interaction with the community. A grievance procedure process will be used to monitor and evaluate the success of the community engagement. The community engagement process will be discussed weekly at the operational call. Kurrent Technology is in the process of drawing up a proposal to implement a grievance procedure process.

## **The Community Trust**

Recently there have been several meetings between the specialist team and the shareholders. The purpose of these meetings was to clarify the content of the Terms of Reference (TOR) of the consultants who will be involved in establishing the Community Trust and undertaking the broad stakeholder engagement with the community. This is being overseen by Kurrent Technologies and the IFC's environmental and social specialists are also involved in defining the Terms of Reference. It is anticipated that the majority of the work to establish the community trust will be undertaken once financial close has been achieved so as not to raise expectations within the community.

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Appendix 1 Revised Layout**

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238000

240000

242000

244000

9815000

9815000

9813000

9813000

9811000

9811000

9809000

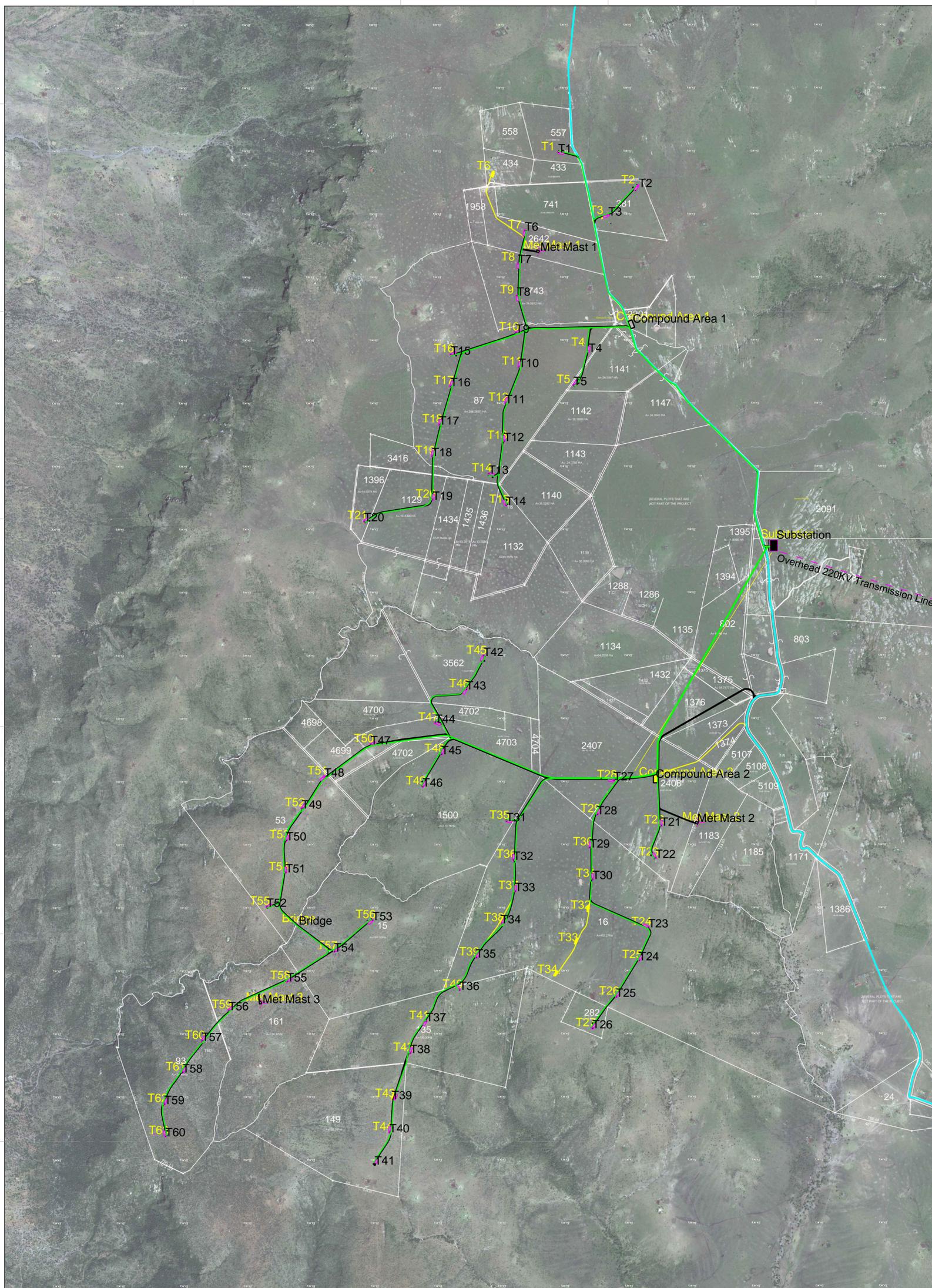
9809000

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Microsoft product Bing aerial mapping reprinted with permission from Microsoft Corporation

238000

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**Legend:**

- Tx Turbine Location
- Turbine & Crane Hardstanding
- Proposed Road Infrastructure
- Public road
- Cable Route
- August 2013 Wind Farm Layout

Client:

**Kipeto Wind Farm**

Job Title:

**Kipeto Wind Farm**

Drawing Title:

**September 2014 Layout**

Date:	Rev:	Description:	Drawn By:
Drawing No.: 140902/CMP/PD/001		Revision No.: 0	
Scale: 1:20,000		Date: 02/09/2014	
Drawn By: C.M.P	Checked By: H.B	Confirmed By: D.S.	



Galetech Energy Developments,  
Clondargan,  
Cavan, Co. Cavan,  
Ireland

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**Appendix 2 Noise**

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Project:

Kipeto

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Licensed user:

**Gaitech Energy Development Limited**  
 Cootehill Enterprise Park, Cootehill  
 IE-CO. Cavan  
 +353 86 8222803

Calculated:

03/09/2014 10:01/2.8.579

## DECIBEL - Main Result

Calculation: Layout August 2014

### Noise calculation model:

ISO 9613-2 General

### Wind speed:

4.0 m/s - 12.0 m/s, step 1.0 m/s

### Ground attenuation:

General, Ground factor: 0.5

### Meteorological coefficient, C0:

0.0 dB

### Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

### Noise values in calculation:

All noise values are 90% exceedance values (L90)

### Pure tones:

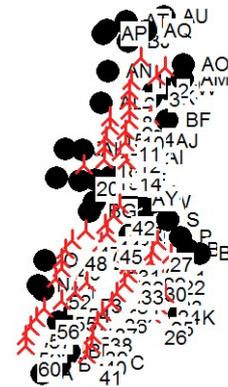
Pure and Impulse tone penalty are added to WTG source noise

### Height above ground level, when no value in NSA object:

4.0 m Don't allow override of model height with height from NSA object

### Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0.0 dB(A)



Scale 1:250,000

New WTG

Noise sensitive area

## WTGs

UTM (south)-WGS84 Zone: 37				WTG type				Noise data									
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Creator	Name	First wind speed [m/s]	LwaRef [dB(A)]	Last wind speed [m/s]	LwaRef [dB(A)]	Pure tones	
			[m]				[kW]	[m]	[m]								
1	241,518	9,814,533	2,001.9	T1	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
2	242,287	9,814,211	2,015.9	T2	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
3	242,007	9,813,923	2,016.2	T3	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
4	241,811	9,812,609	2,009.2	T4	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
5	241,666	9,812,289	2,010.0	T5	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
6	241,197	9,813,779	1,995.7	T6	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
7	241,132	9,813,467	1,992.7	T7	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
8	241,121	9,813,152	1,990.3	T8	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
9	241,110	9,812,795	1,982.9	T9	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
10	241,139	9,812,463	1,993.2	T10	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
11	241,009	9,812,116	1,994.7	T11	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
12	240,997	9,811,749	1,989.6	T12	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
13	240,849	9,811,434	1,980.1	T13	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
14	241,016	9,811,132	1,990.0	T14	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
15	240,484	9,812,584	1,965.4	T15	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
16	240,481	9,812,278	1,974.1	T16	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
17	240,372	9,811,908	1,971.1	T17	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
18	240,304	9,811,604	1,968.7	T18	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
19	240,309	9,811,184	1,977.0	T19	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
20	239,650	9,810,976	1,966.0	T20	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
21	242,508	9,808,042	1,989.3	T21	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
22	242,456	9,807,732	1,971.2	T22	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
23	242,386	9,807,063	1,972.9	T23	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
24	242,296	9,806,744	1,980.6	T24	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
25	242,075	9,806,392	1,965.7	T25	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
26	241,849	9,806,088	1,962.6	T26	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
27	242,054	9,808,480	1,992.8	T27	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
28	241,894	9,808,151	1,993.3	T28	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
29	241,823	9,807,832	1,987.7	T29	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
30	241,849	9,807,527	1,979.5	T30	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
31	241,019	9,808,087	1,980.9	T31	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
32	241,086	9,807,712	1,990.0	T32	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
33	241,104	9,807,410	1,988.0	T33	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
34	240,975	9,807,098	1,972.9	T34	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
35	240,727	9,806,771	1,965.8	T35	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
36	240,567	9,806,459	1,965.6	T36	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
37	240,247	9,806,158	1,932.6	T37	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
38	240,093	9,805,851	1,912.0	T38	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
39	239,943	9,805,406	1,895.4	T39	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
40	239,894	9,805,086	1,884.8	T40	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
41	239,751	9,804,775	1,866.1	T41	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
42	240,799	9,809,679	1,962.6	T42	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
43	240,632	9,809,356	1,981.5	T43	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
44	240,334	9,809,033	1,965.2	T44	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
45	240,394	9,808,731	1,954.6	T45	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
46	240,214	9,808,419	1,933.1	T46	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
47	239,713	9,808,827	1,928.3	T47	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
48	239,266	9,808,515	1,906.6	T48	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
49	239,050	9,808,209	1,903.8	T49	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
50	238,901	9,807,900	1,888.1	T50	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNT	4.0	96.7	12.0	107.0	0 dB
51	238,894	9,807,590	1,863.7	T51	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	8							

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**DECIBEL - Main Result**  
**Calculation: Layout August 2014**

...continued from previous page

UTM (south)-WGS84 Zone: 37				WTG type					Noise data								
East	North	Z	Row	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Creator	Name	First wind speed [m/s]	LwaRef [dB(A)]	Last wind speed [m/s]	LwaRef [dB(A)]	Pure tones	
			data/Description														
53	239,730	9,807,130	1,895.5	T53	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNTE	4.0	96.7	12.0	107.0	0 dB
54	239,362	9,806,829	1,847.8	T54	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNTE	4.0	96.7	12.0	107.0	0 dB
55	238,908	9,806,542	1,814.6	T55	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNTE	4.0	96.7	12.0	107.0	0 dB
56	238,346	9,806,262	1,794.3	T56	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNTE	4.0	96.7	12.0	107.0	0 dB
57	238,088	9,805,967	1,785.9	T57	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNTE	4.0	96.7	12.0	107.0	0 dB
58	237,902	9,805,663	1,785.1	T58	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNTE	4.0	96.7	12.0	107.0	0 dB
59	237,727	9,805,357	1,783.8	T59	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNTE	4.0	96.7	12.0	107.0	0 dB
60	237,737	9,805,049	1,774.1	T60	Yes	GE WIND ENERGY	1.7-103-1,700	1,700	103.0	80.0	USER	Normal Operation with LNTE	4.0	96.7	12.0	107.0	0 dB

**Calculation Results**

**Sound Level**

Noise sensitive area		UTM (south)-WGS84 Zone: 37			Demands		Sound Level		Demands fulfilled ?
No.	Name	East	North	Z	Imission height	Max Noise	Max From WTGs	Noise	
		[m]			[m]	[dB(A)]	[dB(A)]		
A H01		238,289	9,804,115	1,776.6	4.0	43.0	36.2	Yes	
B H02		238,843	9,804,402	1,783.8	4.0	43.0	37.8	Yes	
C H03		240,567	9,804,494	1,824.6	4.0	43.0	38.8	Yes	
D H04		240,527	9,804,574	1,831.0	4.0	43.0	39.6	Yes	
E H05 - Landowner		239,132	9,804,809	1,805.2	4.0	45.0	41.0	Yes	
F H06		238,962	9,804,841	1,794.5	4.0	43.0	40.0	Yes	
G H07 - Landowner		239,158	9,805,290	1,807.1	4.0	45.0	41.8	Yes	
H H08 - Landowner		239,552	9,805,763	1,818.2	4.0	45.0	44.2	Yes	
I H09 - Landowner		239,370	9,805,797	1,815.0	4.0	45.0	43.0	Yes	
J H10 - Landowner		238,818	9,805,821	1,808.1	4.0	45.0	43.1	Yes	
K H11 - Landowner		242,903	9,805,979	1,897.2	4.0	45.0	38.7	Yes	
L H12 - Landowner		242,773	9,806,097	1,907.2	4.0	45.0	40.4	Yes	
M H13 - Landowner		238,311	9,806,877	1,797.6	4.0	45.0	43.8	Yes	
N H14 - Landowner		238,146	9,807,035	1,812.1	4.0	45.0	42.4	Yes	
O H15 - Landowner		238,354	9,807,857	1,854.2	4.0	45.0	43.5	Yes	
P H17 - Landowner		242,829	9,808,634	2,002.1	4.0	45.0	41.2	Yes	
Q H20 - Landowner		241,230	9,808,650	1,982.3	4.0	45.0	44.1	Yes	
R H21 - Landowner		241,154	9,808,714	1,976.4	4.0	45.0	44.0	Yes	
S H22		242,411	9,809,196	1,989.1	4.0	43.0	39.5	Yes	
T H23		242,409	9,809,203	1,989.1	4.0	43.0	39.5	Yes	
U H24		242,397	9,809,234	1,989.0	4.0	43.0	39.3	Yes	
V H25 - Landowner		241,618	9,809,160	1,971.5	4.0	45.0	41.4	Yes	
W H26		241,904	9,809,758	1,968.5	4.0	43.0	38.6	Yes	
X H27 - Landowner		239,984	9,809,790	1,949.1	4.0	45.0	41.8	Yes	
Y H28		241,380	9,810,075	1,959.3	4.0	43.0	40.6	Yes	
Z H29		241,380	9,810,075	1,959.3	4.0	43.0	40.6	Yes	
AA H30		241,380	9,810,075	1,959.3	4.0	43.0	40.6	Yes	
AB H31		241,380	9,810,075	1,959.3	4.0	43.0	40.6	Yes	
AC H32		240,420	9,810,327	1,970.4	4.0	43.0	41.9	Yes	
AD H33		240,451	9,810,359	1,973.7	4.0	43.0	42.0	Yes	
AE H34 - Landowner		240,895	9,810,492	1,981.2	4.0	45.0	42.3	Yes	
AF H35		240,016	9,810,502	1,961.8	4.0	43.0	42.2	Yes	
AG H36 - Landowner		240,511	9,810,602	1,984.7	4.0	45.0	43.0	Yes	
AH H37 - Landowner		239,608	9,811,508	1,986.0	4.0	45.0	43.2	Yes	
AI H38		241,721	9,811,251	1,989.6	4.0	43.0	41.7	Yes	
AJ H40 - Landowner		242,056	9,811,765	2,002.1	4.0	43.0	41.6	Yes	
AK H41 - Landowner		241,830	9,813,200	2,009.2	4.0	45.0	44.2	Yes	
AL H42 - Landowner		240,194	9,813,053	1,966.5	4.0	45.0	42.9	Yes	
AM H44 - Landowner		242,863	9,813,827	2,028.5	4.0	45.0	39.3	Yes	
AN H45		240,424	9,814,088	1,986.7	4.0	43.0	39.5	Yes	
AO H46		242,890	9,814,302	2,022.3	4.0	43.0	39.4	Yes	
AP H47		240,277	9,815,331	2,000.4	4.0	43.0	33.1	Yes	
AQ H48		241,665	9,815,401	1,963.5	4.0	43.0	36.3	Yes	
AR H49		240,390	9,815,444	2,009.7	4.0	43.0	33.0	Yes	
AS H50		241,013	9,815,670	1,970.8	4.0	43.0	33.5	Yes	
AT H51		241,013	9,815,728	1,970.2	4.0	43.0	33.1	Yes	
AU H52		242,260	9,815,884	1,944.8	4.0	43.0	32.2	Yes	

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## DECIBEL - Main Result

Calculation: Layout August 2014

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Noise sensitive area		UTM (south)-WGS84 Zone: 37				Demands		Sound Level		Demands fulfilled ?	
No.	Name	East	North	Z	Imission height	Max Noise	Max From WTGs		Noise		
				[m]	[m]	[dB(A)]	[dB(A)]				
	AV H53	242,260	9,815,884	1,944.8	4.0	43.0	32.2		Yes		
	AW H54 - Landowner	242,344	9,813,532	2,023.6	4.0	45.0	42.5		Yes		
	AX H55 - Landowner	241,930	9,813,379	2,013.3	4.0	45.0	43.7		Yes		
	AY H56	241,294	9,809,897	1,953.9	4.0	43.0	41.9		Yes		
	AZ H57	239,044	9,811,509	2,018.6	4.0	43.0	38.7		Yes		
	BA H58	238,761	9,810,570	2,006.4	4.0	43.0	37.0		Yes		
	BB H59	239,503	9,810,467	1,944.1	4.0	43.0	41.3		Yes		
	BC H60 - Landowner	239,071	9,805,067	1,793.9	4.0	45.0	41.1		Yes		
	BD H61 - Landowner	239,155	9,804,860	1,807.7	4.0	45.0	41.4		Yes		
	BE H62 - Landowner	239,339	9,806,212	1,842.7	4.0	45.0	44.2		Yes		
	BF H63 - Landowner	242,349	9,812,478	2,003.0	4.0	45.0	42.0		Yes		
	BG H64 - Landowner	239,841	9,809,478	1,944.4	4.0	45.0	43.0		Yes		
	BH H65 - Landowner	243,068	9,808,217	1,997.1	4.0	45.0	41.5		Yes		
	BI H67	243,453	9,808,084	1,955.0	4.0	43.0	38.2		Yes		
	BJ H68	241,101	9,815,055	1,988.3	4.0	43.0	38.5		Yes		

## Distances (m)

NSA	WTG																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
A	10907	10859	10489	9195	8844	10092	9775	9470	9127	8821	8451	8100	7754	7528	8749	8452	8067	7755	7352	6995	5764	5518
B	10478	10396	10033	8727	8377	9668	9350	9042	8694	8382	8012	7656	7313	7072	8345	8045	7660	7349	6939	6623	5165	4914
C	10084	9868	9538	8210	7872	9306	8991	8676	8319	7990	7635	7268	6946	6653	8090	7784	7417	7115	6695	6547	4044	3749
D	10008	9796	9465	8137	7799	9229	8914	8599	8242	7913	7557	7190	6868	6576	8010	7704	7336	7034	6614	6462	3994	3701
E	10012	9917	9557	8247	7898	9205	8886	8577	8227	7913	7544	7186	6844	6598	7892	7590	7206	6895	6483	6189	4674	4426
F	10023	9942	9579	8274	7924	9213	8895	8587	8239	7927	7558	7202	6858	6618	7891	7591	7206	6895	6484	6173	4777	4535
G	9540	9454	9091	7785	7435	8730	8412	8103	7755	7442	7073	6716	6372	6130	7414	7112	6728	6417	6005	5707	4335	4104
H	8988	8880	8521	7209	6860	8183	7864	7554	7203	6885	6518	6158	5817	5565	6884	6581	6199	5889	5474	5214	3733	3509
I	8996	8905	8543	7236	6886	8188	7870	7561	7211	6897	6528	6170	5828	5583	6878	6576	6193	5882	5468	5187	3858	3642
J	9121	9079	8707	7419	7067	8306	7988	7684	7341	7036	6665	6316	5969	5748	6965	6668	6282	5971	5566	5222	4307	4109
K	8665	8255	7994	6719	6430	7984	7695	7391	7048	6720	6423	6077	5829	5488	7034	6749	6447	6196	5816	5963	2100	1809
L	8529	8129	7863	6583	6290	7842	7550	7246	6901	6572	6272	5924	5673	5333	6879	6592	6287	6035	5652	5793	1963	1665
M	8301	8342	7957	6716	6368	7481	7168	6875	6547	6261	5893	5563	5216	5042	6107	5821	5437	5130	4748	4312	4356	4232
N	8221	8285	7896	6671	6324	7402	7091	6802	6478	6198	5832	5509	5163	5002	6021	5739	5357	5053	4679	4218	4477	4366
O	7388	7473	7081	5876	5533	6569	6260	5974	5655	5383	5019	4705	4361	4220	5185	4906	4526	4224	3859	3378	4158	4104
P	6043	5603	5352	4103	3836	5398	5122	4830	4502	4185	3929	3614	3429	3087	4594	4335	4093	3898	3585	3949	673	976
Q	5890	5661	5330	4001	3665	5129	4818	4503	4147	3814	3473	3108	2810	2491	4004	3705	3369	3096	2696	2812	1415	1532
R	5830	5613	5278	3950	3611	5065	4753	4438	4081	3749	3405	3039	2737	2422	3928	3627	3288	3012	2611	2716	1512	1631
S	5411	5017	4744	3465	3181	4741	4458	4161	3827	3506	3239	2918	2729	2386	3898	3636	3393	3200	2893	3285	1158	1465
T	5404	5009	4737	3458	3174	4734	4451	4154	3820	3499	3232	2911	2722	2379	3891	3629	3386	3193	2887	3280	1165	1472
U	5371	4978	4705	3425	3141	4701	4418	4121	3786	3465	3199	2878	2690	2347	3858	3597	3354	3162	2857	3253	1197	1503
V	5374	5095	4779	3454	3129	4638	4334	4023	3670	3338	3018	2662	2401	2062	3607	3319	3017	2775	2410	2678	1429	1656
W	4791	4469	4166	2853	2542	4083	3788	3483	3139	2811	2522	2188	1980	1636	3163	2894	2640	2443	2140	2562	1819	2100
X	4985	4985	4602	3359	3012	4169	3852	3549	3209	2912	2542	2205	1858	1693	2838	2537	2153	1842	1431	1232	3070	3217
Y	4460	4234	3899	2570	2232	3709	3401	3088	2733	2400	2074	1717	1459	1118	2664	2379	2092	1870	1542	1951	2325	2578
Z	4460	4234	3899	2570	2232	3709	3401	3088	2733	2400	2074	1717	1459	1118	2664	2379	2092	1870	1542	1951	2325	2578
AA	4460	4234	3899	2570	2232	3709	3401	3088	2733	2400	2074	1717	1459	1118	2664	2379	2092	1870	1542	1951	2325	2578
AB	4460	4234	3899	2570	2232	3709	3401	3088	2733	2400	2074	1717	1459	1118	2664	2379	2092	1870	1542	1951	2325	2578
AC	4347	4309	3931	2673	2324	3538	3220	2911	2563	2254	1883	1535	1187	1002	2258	1952	1582	1282	864	1007	3095	3298
AD	4308	4267	3889	2629	2281	3500	3182	2872	2524	2214	1843	1493	1146	957	2225	1919	1551	1254	837	1011	3098	3305
AE	4089	3971	3607	2307	1955	3301	2984	2670	2313	1986	1628	1261	943	651	2132	1833	1509	1259	907	1336	2933	3171
AF	4302	4349	3958	2768	2432	3483	3168	2871	2541	2260	1895	1587	1250	1182	2134	1836	1450	1139	742	599	3502	3691
AG	4058	4022	3642	2391	2045	3250	2932	2622	2273	1964	1594	1246	898	732	1982	1676	1313	1023	616	939	3247	3467
AH	3578	3806	3404	2463	2201	2772	2482	2234	1978	1804	1527	1410	1243	1457	1387	1164	862	703	772	534	4519	4730
AI	3288	3014	2687	1361	1039	2582	2293	1993	1660	1344	1120	879	891	715	1819	1610	1500	1460	1414	2089	3304	3595
AJ	2820	2457	2159	879	653	2190	1937	1673	1399	1152	1104	1059	1252	1217	1773	1656	1690	1750	1841	2532	3750	4053
AK	1369	1109	744	591	926	858	747	711	826	1010	1360	1673	2020	2222	1480	1634	1948	2208	2525	3114	5202	5504
AL	1986	2392	2011	1677	1658	1238	1025	932	952	1114	1242	1531	1746	2089	551	826	1159	1453	1873	2147	5519	5782
AM	1519	692	861	1609	1949	1667	1768	1868	2034	2198	2523	2793	3128	3267	2684	2841	3144	3390	3675	4296	5796	6109
AN	1181	1867	1592	2028	2186	832	942	1167	1464	1775	2057	2408	2688	3015	1505	1811	2181	2487	2906	3207	6395	6673
AO	1391	610	961	2008	2356	1772	1946	2110	2332	2539	2884	3178	3520	3682	2956	3146	3474	3737	4048	4643	6272	6584
AP	1475	2301	2231	3124	3344	1804	2051	2337	2669	2995	3297	3654	3939	4264	2755	3060	3424	3727	4147	4400	7623	7905

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**DECIBEL - Main Result**

Calculation: Layout August 2014

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**WTG**

NSA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
AQ	880	1343	1517	2796	3112	1688	2006	2314	2664	2985	3350	3713	4050	4318	3055	3340	3725	4034	4430	4862	7407	7710
AR	1450	2262	2220	3171	3403	1850	2112	2406	2745	3074	3385	3745	4036	4357	2862	3167	3536	3841	4261	4529	7699	7984
AS	1244	1937	2010	3163	3443	1900	2206	2520	2877	3209	3554	3921	4239	4538	3131	3433	3816	4127	4541	4888	7773	8068
AT	1297	1981	2061	3219	3500	1958	2264	2578	2935	3267	3612	3979	4297	4596	3188	3491	3873	4185	4598	4944	7830	8125
AU	1541	1673	1977	3306	3644	2358	2667	2960	3296	3600	3970	4324	4668	4912	3748	4021	4401	4706	5089	5559	7846	8154
AV	1541	1673	1977	3306	3644	2358	2667	2960	3296	3600	3970	4324	4668	4912	3748	4021	4401	4706	5089	5559	7846	8154
AW	1298	681	516	1066	1416	1173	1214	1281	1437	1611	1946	2235	2576	2743	2088	2246	2555	2807	3107	3714	5492	5801
AX	1225	905	549	779	1122	835	803	840	1007	1210	1563	1878	2225	2426	1650	1820	2143	2407	2729	3313	5368	5671
AY	4641	4427	4089	2761	2421	3883	3574	3260	2904	2571	2237	1876	1600	1266	2806	2516	2212	1973	1621	1966	2217	2457
AZ	3907	4221	3822	2978	2736	3129	2862	2648	2434	2302	2057	1968	1807	2008	1797	1630	1387	1264	1306	807	4901	5090
BA	4828	5068	4667	3669	3375	4029	3744	3498	3235	3039	2728	2528	2260	2324	2650	2424	2094	1857	1665	977	4520	4659
BB	4538	4666	4268	3149	2825	3720	3414	3135	2829	2581	2233	1969	1657	1653	2333	2058	1683	1391	1079	530	3861	4025
BC	9777	9693	9330	8024	7674	8968	8649	8341	7992	7680	7311	6954	6611	6369	7649	7348	6964	6652	6241	5937	4546	4308
BD	9957	9862	9501	8192	7842	9150	8831	8522	8172	7858	7489	7131	6789	6542	7838	7536	7152	6841	6428	6136	4623	4375
BE	8602	8525	8160	6858	6507	7792	7473	7165	6817	6505	6136	5780	5436	5198	6474	6173	5789	5478	5066	4774	3659	3468
BF	2217	1734	1485	554	709	1738	1568	1401	1279	1210	1388	1536	1828	1894	1868	1879	2058	2224	2416	3089	4439	4747
BG	5326	5328	4945	3699	3351	4510	4193	3891	3551	3255	2885	2548	2200	2029	3172	2872	2487	2176	1769	1510	3029	3144
BH	6503	6045	5804	4568	4307	5868	5596	5305	4979	4664	4409	4094	3908	3565	5074	4815	4571	4372	4052	4393	587	781
BI	6733	6237	6015	4814	4569	6126	5862	5579	5261	4953	4715	4412	4243	3902	5391	5140	4911	4723	4415	4778	946	1057
BJ	668	1456	1450	2547	2823	1280	1588	1903	2260	2592	2940	3308	3630	3924	2547	2845	3230	3542	3951	4329	7153	7447

**WTG**

NSA	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
A	5047	4792	4418	4070	5764	5412	5129	4931	4820	4556	4334	4014	3605	3269	2830	2504	2098	1876	1604	6104	5741	5326
B	4431	4172	3796	3447	5190	4834	4544	4336	4280	3998	3763	3437	3027	2684	2248	1914	1489	1254	982	5628	5267	4865
C	3148	2838	2424	2046	4254	3890	3566	3293	3621	3260	2965	2636	2283	1965	1694	1437	1105	896	863	5190	4862	4545
D	3107	2800	2388	2010	4194	3829	3506	3235	3547	3187	2894	2563	2206	1885	1609	1349	1017	814	802	5112	4783	4463
E	3958	3709	3342	3003	4692	4336	4047	3843	3782	3499	3264	2939	2529	2187	1750	1417	1007	811	620	5147	4788	4392
F	4082	3839	3478	3145	4775	4422	4139	3943	3843	3571	3345	3024	2615	2279	1840	1516	1132	964	792	5175	4814	4411
G	3683	3458	3118	2807	4308	3959	3683	3499	3360	3096	2878	2563	2158	1831	1393	1090	794	764	785	4686	4325	3923
H	3118	2914	2600	2320	3694	3345	3072	2896	2748	2480	2263	1951	1548	1231	799	548	529	758	1008	4110	3752	3362
I	3271	3075	2770	2496	3795	3451	3187	3023	2822	2571	2368	2066	1670	1368	948	725	694	883	1091	4137	3776	3377
J	3778	3598	3307	3043	4188	3859	3616	3478	3159	2953	2784	2507	2132	1862	1468	1275	1199	1303	1402	4337	3973	3552
K	1201	977	925	1060	2641	2395	2145	1873	2827	2511	2299	2229	2316	2385	2662	2813	3015	3139	3374	4256	4070	3991
L	1041	804	758	924	2489	2234	1978	1703	2653	2335	2124	2058	2154	2236	2527	2691	2913	3051	3299	4090	3899	3817
M	4079	3987	3795	3625	4072	3803	3640	3597	2966	2898	2843	2673	2418	2294	2065	2056	2197	2390	2548	3747	3396	2956
N	4240	4160	3981	3822	4167	3911	3762	3736	3060	3017	2982	2830	2594	2489	2277	2279	2425	2618	2772	3746	3401	2963
O	4109	4096	3999	3917	3752	3552	3469	3511	2675	2736	2786	2729	2610	2618	2544	2655	2921	3170	3384	3049	2727	2303
P	1632	1964	2365	2728	790	1052	1287	1478	1891	1972	2115	2408	2809	3138	3577	3903	4330	4605	4936	2283	2313	2527
Q	1963	2184	2411	2636	841	831	1010	1282	601	949	1246	1573	1945	2289	2679	3021	3490	3806	4148	1116	925	974
R	2060	2277	2498	2716	930	930	1107	1375	641	1004	1305	1626	1989	2330	2712	3053	3523	3841	4181	1028	827	880
S	2133	2455	2824	3158	800	1166	1485	1761	1780	1989	2213	2542	2952	3300	3730	4070	4523	4819	5160	1683	1786	2083
T	2140	2462	2831	3165	805	1171	1491	1767	1783	1993	2218	2547	2957	3305	3734	4074	4528	4824	5165	1679	1784	2082
U	2171	2492	2860	3193	828	1194	1515	1793	1793	2009	2236	2566	2976	3324	3753	4093	4547	4845	5185	1659	1769	2073
V	2233	2509	2805	3081	808	1046	1344	1649	1229	1543	1824	2160	2550	2898	3300	3644	4111	4424	4766	970	1005	1290
W	2738	3039	3370	3670	1287	1607	1928	2232	1891	2203	2481	2818	3211	3560	3963	4306	4773	5086	5428	1108	1334	1729
X	3634	3824	3990	4145	2450	2517	2686	2932	1993	2352	2630	2869	3109	3382	3642	3941	4384	4705	5020	823	780	834
Y	3176	3455	3748	4014	1732	1991	2286	2591	2021	2381	2679	3004	3368	3706	4078	4416	4885	5206	5545	703	1038	1476
Z	3176	3455	3748	4014	1732	1991	2286	2591	2021	2381	2679	3004	3368	3706	4078	4416	4885	5206	5545	703	1038	1476
AA	3176	3455	3748	4014	1732	1991	2286	2591	2021	2381	2679	3004	3368	3706	4078	4416	4885	5206	5545	703	1038	1476
AB	3176	3455	3748	4014	1732	1991	2286	2591	2021	2381	2679	3004	3368	3706	4078	4416	4885	5206	5545	703	1038	1476
AC	3810	4044	4269	4473	2466	2628	2862	3144	2319	2698	2996	3276	3569	3871	4173	4488	4944	5267	5592	751	994	1297
AD	3822	4059	4287	4494	2470	2638	2875	3158	2342	2722	3020	3303	3599	3902	4206	4522	4979	5302	5628	764	1019	1331
AE	3739	4001	4266	4506	2322	2545	2817	3115	2408	2787	3089	3395	3725	4046	4382	4710	5174	5498	5830	819	1166	1563
AF	4177	4396	4597	4779	2871	3009	3224	3494	2615	2988	3278	3537	3798	4080	4350	4652	5097	5417	5733	1136	1301	1503
AG	4005	4251	4491	4708	2624	2814	3065	3353	2566	2947	3247	3535	3837	4143	4452	4769	5227	5550	5876	967	1252	1579
AH	5242	5470	5680	5865	3893	4061	4292	4568	3701	4074	4363	4617	4867	5139	5388	5678	6111	6428	6735	2183	2383	2579
AI	4240	4544	4872	5165	2791	3105	3421	3726	3241	3596	3890	4219	4589	4929	5302	5640	6109	6430	6769	1822	2186	2616
AJ	4714	5027	5373	5681																		

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## DECIBEL - Main Result

Calculation: Layout August 2014

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### WTG

NSA	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
AP	8533	8821	9118	9376	7078	7360	7657	7961	7282	7662	7964	8263	8572	8877	9173	9482	9931	10252	10569	5676	5986	6298
AQ	8369	8680	9018	9315	6932	7254	7571	7876	7342	7711	8011	8332	8681	9009	9351	9679	10142	10466	10797	5787	6133	6506
AR	8615	8906	9207	9469	7160	7446	7746	8050	7384	7763	8066	8366	8680	8987	9287	9598	10048	10370	10688	5779	6093	6411
AS	8716	9018	9339	9618	7265	7570	7880	8186	7583	7958	8261	8572	8904	9222	9543	9862	10320	10643	10968	5995	6325	6672
AT	8773	9075	9396	9676	7322	7628	7937	8244	7641	8016	8318	8630	8962	9280	9601	9920	10377	10701	11025	6053	6383	6729
AU	8822	9140	9494	9805	7407	7742	8064	8367	7895	8256	8552	8879	9241	9576	9932	10264	10731	11054	11389	6375	6728	7117
AV	8822	9140	9494	9805	7407	7742	8064	8367	7895	8256	8552	8879	9241	9576	9932	10264	10731	11054	11389	6375	6728	7117
AW	6469	6788	7145	7460	5060	5400	5724	6025	5604	5954	6246	6578	6952	7293	7666	8004	8473	8794	9133	4151	4513	4928
AX	6332	6645	6989	7291	4901	5228	5548	5853	5370	5730	6026	6353	6717	7053	7415	7749	8217	8539	8876	3869	4227	4630
AY	3037	3308	3591	3849	1608	1846	2132	2434	1831	2195	2494	2817	3177	3514	3883	4220	4690	5011	5349	541	855	1292
AZ	5562	5769	5947	6104	4270	4404	4609	4871	3951	4311	4588	4815	5028	5275	5485	5754	6169	6479	6771	2536	2675	2792
BA	5044	5209	5333	5443	3900	3958	4108	4335	3356	3684	3934	4118	4278	4490	4656	4903	5298	5600	5879	2224	2230	2199
BB	4461	4654	4819	4968	3234	3329	3511	3761	2822	3177	3451	3677	3893	4147	4373	4654	5080	5395	5697	1517	1584	1657
BC	3870	3635	3283	2960	4533	4181	3901	3711	3594	3325	3102	2784	2376	2043	1604	1288	936	823	740	4925	4564	4162
BD	3911	3663	3297	2961	4638	4282	3994	3791	3727	3444	3210	2885	2474	2133	1696	1365	959	773	602	5092	4732	4336
BE	3164	3004	2742	2513	3538	3207	2966	2834	2518	2303	2133	1861	1496	1253	910	836	1007	1255	1495	3762	3399	2991
BF	5415	5734	6092	6410	4009	4351	4676	4976	4588	4931	5219	5553	5933	6277	6660	7000	7470	7789	8129	3200	3563	3991
BG	3508	3674	3810	3940	2428	2445	2576	2800	1823	2161	2423	2636	2848	3105	3345	3636	4073	4392	4704	979	800	664
BH	1340	1663	2078	2453	1048	1176	1303	1401	2053	2045	2123	2373	2752	3057	3492	3801	4203	4458	4780	2699	2689	2853
BI	1477	1770	2182	2561	1454	1560	1649	1698	2434	2396	2444	2667	3026	3312	3740	4034	4415	4653	4965	3096	3095	3260
BJ	8095	8396	8718	8998	6644	6949	7259	7565	6968	7343	7645	7958	8292	8613	8938	9259	9718	10042	10368	5384	5718	6071

### WTG

NSA	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
A	5073	4715	4922	4507	4164	3834	3527	3173	3342	2918	2505	2148	1863	1596	1363	1085
B	4598	4245	4510	4135	3813	3498	3188	2861	2869	2482	2141	1925	1738	1573	1469	1281
C	4241	3941	4416	4226	4013	3792	3519	3330	2766	2628	2636	2839	2884	2910	2968	2884
D	4159	3858	4330	4138	3924	3702	3430	3242	2677	2538	2548	2758	2809	2842	2907	2830
E	4120	3769	4060	3708	3401	3100	2791	2487	2397	2033	1747	1652	1559	1497	1508	1415
F	4145	3791	4056	3687	3369	3060	2750	2432	2414	2028	1702	1549	1425	1341	1338	1243
G	3656	3302	3580	3227	2921	2623	2315	2020	1927	1552	1277	1267	1266	1310	1433	1441
H	3085	2737	3068	2767	2497	2234	1942	1717	1379	1083	1011	1305	1478	1653	1870	1950
I	3108	2754	3049	2720	2433	2155	1855	1604	1381	1032	877	1125	1293	1474	1701	1796
J	3309	2949	3136	2731	2399	2081	1771	1443	1595	1145	727	646	744	930	1186	1328
K	3724	3631	4276	4434	4452	4439	4321	4382	3375	3642	4034	4566	4815	5011	5213	5249
L	3549	3455	4101	4260	4280	4271	4156	4224	3214	3489	3891	4430	4687	4890	5100	5144
M	2789	2449	2402	1896	1523	1181	921	555	1441	1052	685	616	937	1281	1628	1916
N	2816	2488	2380	1856	1482	1148	931	609	1587	1233	908	798	1070	1394	1730	2028
O	2219	1943	1670	1125	780	549	602	696	1556	1440	1427	1595	1909	2240	2577	2875
P	2437	2624	3122	3565	3803	3996	4071	4340	3445	3909	4444	5072	5440	5753	6064	6227
Q	840	1042	1527	1969	2224	2447	2565	2876	2136	2609	3136	3744	4132	4472	4808	5017
R	760	985	1445	1898	2164	2396	2524	2842	2130	2601	3124	3728	4117	4459	4797	5011
S	2070	2330	2723	3218	3503	3742	3866	4175	3385	3860	4395	5013	5396	5728	6056	6249
T	2070	2331	2722	3217	3503	3742	3867	4176	3387	3863	4397	5016	5398	5731	6059	6252
U	2065	2330	2715	3212	3500	3742	3870	4180	3397	3872	4407	5024	5407	5741	6070	6263
V	1297	1588	1934	2439	2738	2995	3144	3472	2772	3244	3768	4371	4760	5103	5441	5654
W	1826	2156	2381	2916	3247	3531	3709	4053	3411	3878	4395	4988	5379	5726	6068	6288
X	1136	1390	1000	1463	1836	2178	2455	2832	2672	3026	3422	3890	4267	4622	4974	5247
Y	1667	2025	2082	2627	2985	3298	3515	3878	3376	3822	4312	4873	5264	5618	5967	6207
Z	1667	2025	2082	2627	2985	3298	3515	3878	3376	3822	4312	4873	5264	5618	5967	6207
AA	1667	2025	2082	2627	2985	3298	3515	3878	3376	3822	4312	4873	5264	5618	5967	6207
AB	1667	2025	2082	2627	2985	3298	3515	3878	3376	3822	4312	4873	5264	5618	5967	6207
AC	1596	1919	1658	2148	2522	2863	3134	3511	3271	3654	4076	4564	4944	5300	5653	5921
AD	1629	1954	1700	2192	2566	2907	3177	3554	3309	3694	4117	4606	4987	5343	5696	5963
AE	1831	2182	2042	2562	2935	3270	3525	3900	3558	3971	4422	4939	5325	5681	6034	6293
AF	1811	2092	1702	2124	2488	2831	3121	3494	3384	3731	4112	4557	4928	5281	5631	5910
AG	1875	2203	1946	2430	2804	3145	3419	3795	3559	3944	4365	4850	5230	5586	5938	6207
AH	2886	3148	2683	3012	3346	3677	3983	4341	4380	4685	5015	5396	5746	6089	6432	6725
AI	2848	3208	3148	3676	4048	4380	4625	4998	4577	5012	5485	6023	6412	6768	7120	7371
AJ	3459	3820	3758	4283	4656	4989	5237	5610	5186	5623	6098	6637	7026	7382	7733	7985
AK	4694	5047	4858	5341	5713	6055	6332	6709	6423	6832	7271	7764	8144	8499	8851	9121
AL	4327	4634	4253	4632	4977	5313	5616	5980	5941	6279	6637	7038	7392	7737	8082	8373

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**DECIBEL - Main Result****Calculation:** Layout August 2014

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**WTG**

NSA	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
AM	5663	6022	5910	6415	6790	7129	7393	7769	7394	7825	8289	8811	9197	9553	9906	10165
AN	5357	5673	5309	5692	6037	6373	6676	7039	6993	7336	7697	8097	8450	8794	9138	9430
AO	6105	6463	6330	6828	7202	7543	7811	8188	7837	8264	8722	9235	9619	9976	10328	10591
AP	6601	6912	6528	6891	7227	7557	7864	8221	8219	8551	8895	9272	9616	9955	10295	10591
AQ	6790	7131	6858	7292	7653	7994	8288	8660	8494	8876	9278	9723	10089	10440	10788	11072
AR	6713	7027	6652	7020	7358	7690	7995	8354	8340	8676	9025	9407	9753	10092	10433	10728
AS	6967	7295	6965	7365	7715	8052	8353	8719	8636	8994	9368	9779	10134	10479	10824	11115
AT	7024	7353	7022	7422	7771	8108	8409	8775	8693	9051	9424	9835	10190	10535	10879	11170
AU	7392	7740	7503	7954	8319	8662	8951	9325	9112	9507	9925	10388	10759	11111	11461	11741
AV	7392	7740	7503	7954	8319	8662	8951	9325	9112	9507	9925	10388	10759	11111	11461	11741
AW	5182	5539	5391	5886	6260	6601	6871	7248	6915	7336	7789	8297	8680	9036	9389	9653
AX	4895	5248	5063	5546	5918	6261	6537	6914	6625	7035	7475	7968	8349	8704	9056	9326
AY	1473	1831	1909	2454	2808	3117	3329	3691	3178	3626	4117	4680	5072	5425	5774	6013
AZ	3089	3304	2764	3002	3300	3612	3922	4262	4432	4691	4969	5293	5624	5956	6291	6591
BA	2459	2596	1986	2116	2379	2674	2983	3310	3574	3789	4031	4328	4652	4982	5315	5615
BB	1951	2168	1653	1966	2303	2637	2941	3303	3345	3641	3970	4361	4717	5064	5410	5699
BC	3896	3542	3814	3454	3142	2838	2529	2222	2166	1786	1484	1398	1333	1312	1375	1334
BD	4064	3713	4006	3657	3351	3051	2742	2441	2342	1980	1700	1619	1538	1488	1512	1431
BE	2731	2374	2642	2304	2018	1744	1448	1221	998	617	543	994	1275	1538	1825	1980
BF	4226	4586	4503	5021	5395	5731	5986	6360	5955	6390	6861	7393	7781	8138	8489	8744
BG	929	1123	663	1122	1495	1837	2112	2489	2351	2692	3081	3547	3924	4279	4632	4903
BH	2723	2861	3410	3814	4018	4179	4221	4460	3511	3957	4485	5111	5465	5763	6059	6201
BI	3127	3256	3813	4209	4405	4556	4586	4812	3843	4279	4799	5422	5768	6056	6342	6472
BJ	6363	6695	6381	6793	7147	7486	7784	8153	8043	8408	8791	9214	9574	9922	10268	10556

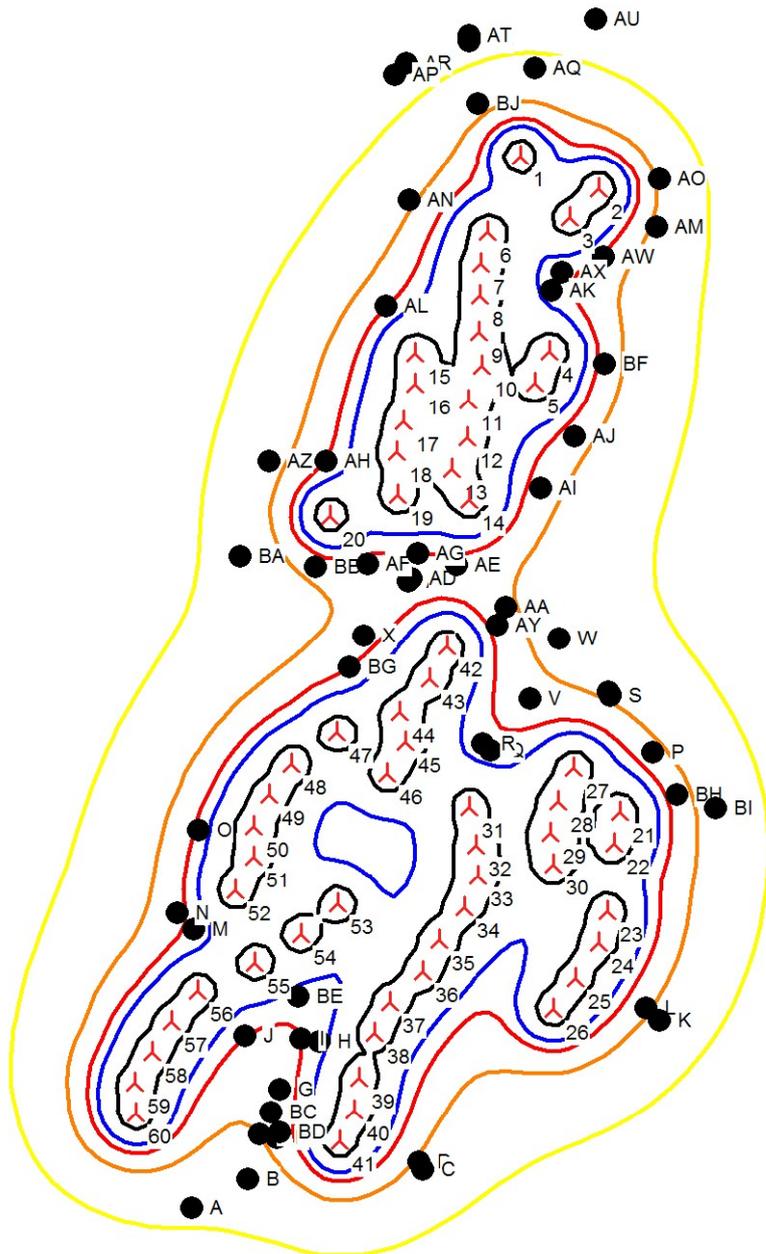
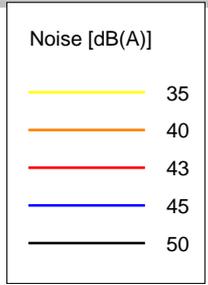
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IE-CO. Cavan  
+353 86 8222803

Calculated:  
03/09/2014 10:01/2.8.579

**DECIBEL - Map 12.0 m/s**  
Calculation: Layout August 2014



Map: Blank map , Print scale 1:75,000, Map center UTM (south)-WGS84 Zone: 37 East: 240,118 North: 9,809,654  
 人 New WTG    Noise sensitive area  
 Noise calculation model: ISO 9613-2 General. Wind speed: 12.0 m/s  
 Height above sea level from active line object

**2014 Kipeto Wind Farm Supplementary  
Appendix 3 Shadow Flicker**



Project:

Kipeto Wind Farm

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03/09/2014 16:09/2.8.579

## SHADOW - Main Result

Calculation: Shadow Flicker Predictions (GE1.7 103m)(03-09-2014)

### Assumptions for shadow calculations

Maximum distance for influence  
Calculate only when more than 20 % of sun is covered by the blade  
Please look in WTG table

Minimum sun height over horizon for influence 3 °  
Day step for calculation 1 days  
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [NAIROBI / DAGOR ETTI]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
9.22 9.20 8.45 7.04 6.12 5.08 4.28 4.16 6.18 7.43 6.87 8.47

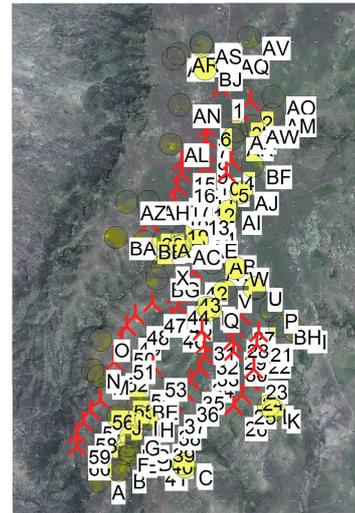
#### Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
9	166	2,234	3,960	1,628	516	158	44	26	9	9	0	8,759

Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:  
Height contours used: Height Contours: 30m DEM.wpo (3)

Obstacles used in calculation  
Eye height: 1.5 m  
Grid resolution: 10.0 m



New WTG

Shadow receptor  
Scale 1:200,000

### WTGs

	UTM (south)-WGS84 Zone: 37			Row	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
	East	North	Z [m]		Valid	Manufact.					Calculation distance [m]	RPM [RPM]
1	241,518	9,814,533	2,001.7	T1	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
2	242,287	9,814,211	2,016.3	T2	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
3	242,007	9,813,923	2,016.6	T3	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
4	241,811	9,812,609	2,009.3	T4	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
5	241,666	9,812,289	2,010.0	T5	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
6	241,197	9,813,779	1,995.6	T6	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
7	241,132	9,813,467	1,993.0	T7	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
8	241,121	9,813,152	1,990.4	T8	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
9	241,110	9,812,795	1,983.3	T9	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
10	241,139	9,812,463	1,993.1	T10	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
11	241,009	9,812,116	1,994.6	T11	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
12	240,997	9,811,749	1,989.7	T12	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
13	240,849	9,811,434	1,980.0	T13	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
14	241,016	9,811,132	1,989.9	T14	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
15	240,484	9,812,584	1,965.6	T15	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
16	240,481	9,812,278	1,974.1	T16	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
17	240,372	9,811,908	1,971.1	T17	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
18	240,304	9,811,604	1,968.8	T18	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
19	240,309	9,811,184	1,976.9	T19	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
20	239,650	9,810,976	1,966.0	T20	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
21	242,508	9,808,042	1,989.4	T21	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
22	242,456	9,807,732	1,971.4	T22	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
23	242,386	9,807,063	1,972.7	T23	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
24	242,296	9,806,744	1,980.5	T24	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
25	242,075	9,806,392	1,965.8	T25	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
26	241,849	9,806,088	1,952.9	T26	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
27	242,054	9,808,480	1,992.8	T27	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
28	241,894	9,808,151	1,994.4	T28	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
29	241,823	9,807,832	1,987.8	T29	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
30	241,849	9,807,527	1,979.2	T30	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
31	241,019	9,808,087	1,980.9	T31	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
32	241,086	9,807,712	1,989.8	T32	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5

To be continued on next page...

Project:

Kipeto Wind Farm

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**SHADOW - Main Result****Calculation:** Shadow Flicker Predictions (GE1.7 103m)(03-09-2014)

...continued from previous page

UTM (south)-WGS84 Zone: 37				WTG type			Shadow data				
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [RPM]
33	241,104	9,807,410	1,987.9 T33	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
34	240,975	9,807,098	1,972.9 T34	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
35	240,727	9,806,771	1,965.9 T35	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
36	240,567	9,806,459	1,965.6 T36	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
37	240,247	9,806,158	1,932.4 T37	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
38	240,093	9,805,851	1,911.9 T38	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
39	239,943	9,805,406	1,894.8 T39	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
40	239,894	9,805,086	1,884.7 T40	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
41	239,751	9,804,775	1,866.2 T41	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
42	240,799	9,809,679	1,962.3 T42	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
43	240,632	9,809,356	1,981.3 T43	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
44	240,334	9,809,033	1,965.5 T44	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
45	240,394	9,808,731	1,954.6 T45	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
46	240,214	9,808,419	1,933.0 T46	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
47	239,713	9,808,827	1,928.3 T47	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
48	239,266	9,808,515	1,906.6 T48	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
49	239,050	9,808,209	1,903.6 T49	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
50	238,901	9,807,900	1,888.0 T50	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
51	238,894	9,807,590	1,863.9 T51	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
52	238,712	9,807,260	1,832.7 T52	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
53	239,730	9,807,130	1,895.5 T53	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
54	239,362	9,806,829	1,847.7 T54	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
55	238,908	9,806,542	1,814.4 T55	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
56	238,346	9,806,262	1,794.4 T56	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
57	238,088	9,805,967	1,785.9 T57	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
58	237,902	9,805,663	1,784.8 T58	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
59	237,727	9,805,357	1,783.8 T59	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5
60	237,737	9,805,049	1,773.8 T60	Yes	GE WIND ENERGY	GE 1.7-103-1,700	1,700	103.0	80.0	2,000	17.5

**Shadow receptor-Input**

UTM (south)-WGS84 Zone: 37										
No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
		[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
A	H01	238,289	9,804,115	1,776.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
B	H02	238,843	9,804,402	1,783.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
C	H03	240,567	9,804,494	1,824.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
D	H04	240,527	9,804,574	1,830.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
E	H05-Landowner	239,132	9,804,809	1,805.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
F	H06	238,962	9,804,841	1,794.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
G	H07-Landowner	239,158	9,805,290	1,807.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
H	H08-Landowner	239,552	9,805,763	1,818.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
I	H09-Landowner	239,370	9,805,797	1,814.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
J	H10-Landowner	238,818	9,805,821	1,808.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
K	H11-Landowner	242,903	9,805,979	1,896.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
L	H12-Landowner	242,773	9,806,097	1,907.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
M	H13-Landowner	238,311	9,806,877	1,798.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
N	H14-Landowner	238,146	9,807,035	1,811.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
O	H15-Landowner	238,354	9,807,857	1,854.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
P	H17-Landowner	242,829	9,808,634	2,002.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
Q	H20-Landowner	241,230	9,808,650	1,982.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
R	H21-Landowner	241,154	9,808,714	1,976.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
S	H22	242,411	9,809,196	1,989.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
T	H23	242,409	9,809,203	1,989.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
U	H24	242,397	9,809,234	1,989.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
V	H25-Landowner	241,618	9,809,160	1,971.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
W	H26	241,904	9,809,758	1,968.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
X	H27-Landowner	239,984	9,809,790	1,949.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"

To be continued on next page...

Project:

Kipeto Wind Farm

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Cootehill Enterprise Park, Cootehill

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**SHADOW - Main Result****Calculation:** Shadow Flicker Predictions (GE1.7 103m)(03-09-2014)

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**UTM (south)-WGS84 Zone: 37**

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
Y	H28	241,380	9,810,075	1,959.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
Z	H29	241,380	9,810,075	1,959.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AA	H30	241,380	9,810,075	1,959.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AB	H31	241,380	9,810,075	1,959.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AC	H32	240,420	9,810,327	1,970.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AD	H33	240,451	9,810,359	1,973.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AE	H34-Landowner	240,895	9,810,492	1,981.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AF	H35	240,016	9,810,502	1,961.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AG	H36-Landowner	240,511	9,810,602	1,984.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AH	H37-Landowner	239,608	9,811,508	1,985.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AI	H38	241,721	9,811,251	1,989.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AJ	H40-Landowner	242,056	9,811,765	2,002.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AK	H41-Landowner	241,830	9,813,200	2,009.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AL	H42-Landowner	240,194	9,813,053	1,966.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AM	H44-Landowner	242,863	9,813,827	2,028.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AN	H45	240,424	9,814,088	1,986.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AO	H46	242,890	9,814,302	2,022.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AP	H47	240,277	9,815,331	2,000.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AQ	H48	241,665	9,815,401	1,963.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AR	H49	240,390	9,815,444	2,009.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AS	H50	241,013	9,815,670	1,970.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AT	H51	241,013	9,815,728	1,969.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AU	H52	242,260	9,815,884	1,944.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AV	H53	242,260	9,815,884	1,944.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AW	H54-Landowner	242,344	9,813,532	2,023.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AX	H55-Landowner	241,930	9,813,379	2,013.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AY	H56	241,294	9,809,897	1,954.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AZ	H57	239,044	9,811,509	2,018.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BA	H58	238,761	9,810,570	2,006.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BB	H59	239,503	9,810,467	1,943.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BC	H60-Landowner	239,071	9,805,067	1,794.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BD	H61-Landowner	239,155	9,804,860	1,807.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BE	H62-Landowner	239,339	9,806,212	1,842.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BF	H63-Landowner	242,349	9,812,478	2,003.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BG	H64-Landowner	239,841	9,809,478	1,944.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BH	H65-Landowner	243,068	9,808,217	1,996.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BI	H67	243,453	9,808,084	1,954.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BJ	H68	241,101	9,815,055	1,988.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"

**Calculation Results**

Shadow receptor

No.	Name	Shadow, worst case			Shadow, expected values	
		Shadow hours per year	Shadow days per year	Max shadow hours per day	Shadow hours per year	
		[h/year]	[days/year]	[h/day]	[h/year]	
A	H01	9:04	41	0:16	3:13	
B	H02	28:08	76	0:26	10:14	
C	H03	22:35	61	0:28	7:11	
D	H04	18:48	47	0:30	6:30	
E	H05-Landowner	53:50	140	0:37	23:45	
F	H06	37:51	158	0:29	16:13	
G	H07-Landowner	40:28	154	0:31	19:24	
H	H08-Landowner	36:42	123	0:43	15:25	
I	H09-Landowner	55:01	150	0:34	22:07	
J	H10-Landowner	57:06	212	0:37	27:09	
K	H11-Landowner	15:38	59	0:23	5:52	
L	H12-Landowner	49:20	111	0:33	16:44	
M	H13-Landowner	13:26	52	0:22	6:34	

To be continued on next page...

Project:

Kipeto Wind Farm

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03/09/2014 16:09 / 4

Licensed user:

**Galetech Energy Development Limited**  
Cootehill Enterprise Park, Cootehill  
IE-CO. Cavan  
+353 86 8222803

Calculated:

03/09/2014 16:09/2.8.579

**SHADOW - Main Result****Calculation:** Shadow Flicker Predictions (GE1.7 103m)(03-09-2014)

...continued from previous page

No.	Name	Shadow, worst case		Max shadow hours per day	Shadow, expected values
		Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]
N	H14-Landowner	67:48	141	0:41	26:48
O	H15-Landowner	67:12	160	0:42	31:26
P	H17-Landowner	14:03	53	0:23	8:24
Q	H20-Landowner	39:37	143	0:32	16:56
R	H21-Landowner	53:33	184	0:31	22:20
S	H22	1:12	32	0:03	0:28
T	H23	1:04	29	0:03	0:25
U	H24	1:05	26	0:04	0:27
V	H25-Landowner	16:39	97	0:20	7:33
W	H26	11:26	75	0:14	6:31
X	H27-Landowner	14:32	38	0:28	7:57
Y	H28	0:00	0	0:00	0:00
Z	H29	0:00	0	0:00	0:00
AA	H30	0:00	0	0:00	0:00
AB	H31	0:00	0	0:00	0:00
AC	H32	0:00	0	0:00	0:00
AD	H33	0:00	0	0:00	0:00
AE	H34-Landowner	5:39	60	0:08	1:42
AF	H35	0:00	0	0:00	0:00
AG	H36-Landowner	15:13	62	0:17	4:24
AH	H37-Landowner	48:34	198	0:25	22:47
AI	H38	31:11	111	0:30	15:50
AJ	H40-Landowner	16:48	118	0:14	7:06
AK	H41-Landowner	46:07	134	0:24	17:11
AL	H42-Landowner	46:31	134	0:26	20:19
AM	H44-Landowner	10:01	45	0:19	4:30
AN	H45	54:50	180	0:28	25:24
AO	H46	43:39	139	0:34	25:43
AP	H47	0:00	0	0:00	0:00
AQ	H48	0:00	0	0:00	0:00
AR	H49	0:00	0	0:00	0:00
AS	H50	0:00	0	0:00	0:00
AT	H51	0:00	0	0:00	0:00
AU	H52	0:00	0	0:00	0:00
AV	H53	0:00	0	0:00	0:00
AW	H54-Landowner	6:37	84	0:08	3:08
AX	H55-Landowner	21:40	88	0:19	11:13
AY	H56	50:16	74	0:47	30:20
AZ	H57	2:03	52	0:04	0:59
BA	H58	6:47	61	0:10	2:25
BB	H59	9:36	46	0:14	3:24
BC	H60-Landowner	77:36	216	0:34	35:30
BD	H61-Landowner	50:39	133	0:38	23:50
BE	H62-Landowner	44:59	196	0:26	20:44
BF	H63-Landowner	67:21	148	0:45	29:37
BG	H64-Landowner	26:55	75	0:30	13:13
BH	H65-Landowner	52:52	145	0:37	28:43
BI	H67	25:00	84	0:25	14:07
BJ	H68	0:00	0	0:00	0:00

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	T1	19:49	7:13
2	T2	26:55	15:43
3	T3	29:32	16:13
4	T4	42:22	15:28
5	T5	24:27	14:19
6	T6	34:47	16:53

To be continued on next page...

Project:

Kipeto Wind Farm

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03/09/2014 16:09 / 5

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Cootehill Enterprise Park, Cootehill  
IE-CO. Cavan  
+353 86 8222803

Calculated:

03/09/2014 16:09/2.8.579

**SHADOW - Main Result****Calculation:** Shadow Flicker Predictions (GE1.7 103m)(03-09-2014)

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
7	T7	65:49	23:07
8	T8	36:35	19:47
9	T9	16:34	7:57
10	T10	3:27	1:46
11	T11	18:47	6:59
12	T12	8:14	3:57
13	T13	16:59	7:25
14	T14	31:36	16:12
15	T15	0:00	0:00
16	T16	0:24	0:07
17	T17	0:29	0:11
18	T18	17:43	7:53
19	T19	21:25	10:29
20	T20	22:31	6:59
21	T21	50:57	29:21
22	T22	14:28	8:26
23	T23	0:00	0:00
24	T24	0:00	0:00
25	T25	38:29	11:17
26	T26	19:35	9:40
27	T27	43:25	22:36
28	T28	4:28	2:26
29	T29	4:01	2:19
30	T30	0:00	0:00
31	T31	0:10	0:05
32	T32	0:00	0:00
33	T33	0:00	0:00
34	T34	0:00	0:00
35	T35	12:20	4:28
36	T36	12:02	4:44
37	T37	45:23	18:12
38	T38	60:23	28:34
39	T39	56:31	24:01
40	T40	76:06	33:21
41	T41	144:59	63:04
42	T42	81:40	45:52
43	T43	32:03	15:57
44	T44	27:50	9:17
45	T45	19:51	10:05
46	T46	9:32	4:36
47	T47	0:02	0:01
48	T48	0:00	0:00
49	T49	11:45	4:09
50	T50	30:39	15:14
51	T51	21:07	10:07
52	T52	57:10	20:58
53	T53	8:51	4:04
54	T54	15:12	8:11
55	T55	0:00	0:00
56	T56	10:07	3:35
57	T57	14:33	5:41
58	T58	9:50	5:09
59	T59	19:19	8:08
60	T60	5:10	2:22

**2014 Kipeto Wind Farm Supplementary**

**Appendix 4 Minutes of Meetings with the Local Community**

**2014 Kipeto Wind Farm Supplementary**

DATE: September 13, 2013

## **KIPETO ENERGY LIMITED AND LANDOWNERS ON HOUSE MOVEMENT**

VENUE: Esilanke Market

- The meeting was called by Simon Mwacharo Guyo -: Director Kipeto Energy Limited (KEL)
- Translation in Masai was done by Pastor Wilson Saitaga while Simon spoke in Kiswahili and English.

### **PARTICIPANTS:**

1. Daniel Nkanoni
2. Pastor Stephen Somoine
3. Pastor Wilson Saitaga
4. Noah Lantei
5. Esther Parsapiyio
6. David Risa Saitaga
7. Joyce Narinoi Karu
8. Purity Lekuka
9. Beatrice Saitaga
10. Mary Suyianka
11. Emily Mutete
12. Naomi Sankaire
13. Christopher Sitelu
14. Emily Terta
15. Teresia Murkuku
16. Payakyoni Tepela
17. Lemeyian Tepela
18. Joseph Kereya
19. Elizabeth Mutunkei
20. Pastor Tepela
21. Menye Nchancha
22. Simango Nkukuu
23. Mzee Nkanoni
24. Ezekiel Nkanoni

### **AGENDA:**

1. Progress Report on KEL
2. Voluntary house relocation

MINUTES:

1. The meeting was called to order at 1:30PM by Pastor Wilson Saitaga with a prayer
2. Pastor Saitaga gave a brief introduction of the KEL project. He explained that the purpose of the meeting was once again to inform and engage the landowners whose homes will be affected by the turbines. He reiterated that KEL was to take charge of building houses for those landowners who will have to relocate. The landowners will be handed over keys to the homes. These houses will be built to international standards of safety and materials.
3. Simon thanked the attendees' for showing up for the meeting. He noted that many of them were women. They responded that in their culture women are the "Manyatta" home builders and therefore homes are owned by women. Simon gave a brief progress update for KEL; The PPA progress, The Transmission Line progress, The Final layout of the wind farm showing turbine locations and roads, Change of use process and the anticipated equity buyer of the project as KEL approaches Financial Close.
4. Simon gave printouts of the farm footprint on each parcel to the specific landowners and explained the reasons for Change of Use. As has been said before KEL was going to approach the Land Commission for the Change of Use to enable the foreign companies in KEL like GE to own their shares. This process began by ascertaining the size of the footprint on each parcel. Simon informed the meeting that at present they do not pay land rates to the Kajiado County; but once the land has been changed or extended to commercial then they will be paying the land rates annually. He explained that the actual footprint of the wind farm will be used to determine the rates. He gave an example of Mr Lantans plot 802 farm where two telecom companies have erected communication masts. Mr Lantan only pays for the area occupied by the masts and not his entire land.
5. **Question 01:** What will happen to those land owners affected by the wind farm yet their plots are too small for them to move anywhere else unless they are moved entirely out of Kipeto.
6. Simon informed the meeting that KEL has undertaken extensive survey work involving accurate GPS border and house marking. Simon asked the participants whether they saw Europeans walking their land and some people from Nairobi doing the same with some equipment on a pole. The meeting affirmed that they did see experts doing the survey work. Therefore Simon explained to them that there was no house which was going to be relocated outside the borders of the landowners parcel. And that there was

only one particular case next to the plot 16 belonging to Korash Saitaga. This case was going to be handled separately.

7. **Question 02:** What kind of houses do we expect, their standard, size
8. Simon explained that this is not the first time projects were building houses for landowners who are relocating. He made mention that at Olkaria Geothermal power station KENGEN has already done houses for the landowners relocation. KEL was going to use the same way to bring better housing for the relocation exercise. KEL was definitely not going to build Manyattas for the landowners but standard buildings to replace their Manyattas, iron sheet structures, mud and stone houses with permanent two and three bedroom houses.
9. Simon gave a brief time line for the delivery of the new houses. He stated that the main contractor EPC was going to be in charge of building all the structures on the site including turbine foundations and roads. This contractor will be given the task of building the houses. Simon said that the houses will be ready for them to move in before the turbines start operating as the NEMA requirements stipulate. As the turbines are being done in phase so shall the affected people be moved to safety. Simon reiterated that it is not easy to give clear dates and time lines as these processes will be tackled in the next coming months. It is in the interest of KEL to have the relocated land owners at a safe and peaceful distance from the construction commotion. The law in Kenya does not allow KEL to take away any materials from the demolished old houses. This material will belong to the landowners and has to be cleared from site as soon as the houses are ready for occupation.
10. The meeting suggested that they get two bedroom houses (two sleeping rooms, sitting room, kitchen, bathroom and toilet) for the families living in Manyattas and three bedrooms (three sleeping rooms, sitting room, kitchen, bathroom and toilet) for families who have constructed corrugated iron sheet, and stone houses. They also suggested that KEL to construct their sheep and goat huts plus enclosures for their cattle comprised of steel chain link.
11. **Question 03:** What will happen to those with up to 5 bedroom houses made of iron sheets if the biggest house in the relocation will be 3 bedrooms?
12. Simon explained that in anything KEL or any project was going to do for many people; there will be only a few agreed house sizes. These will not satisfy everyone; there will be people whose dreams will be fully satisfied and others who will not. Simon stated that the two sizes were adequate as this was going to change their standard of living in general within the project area. Anyone who wanted a dream house bigger than the offer then they will have to build for themselves those houses from their project

revenue earnings. Though there will be cases the project will have no choice but to look at individually; these will have to be very few.

13. Simon stressed that KEL has already done a survey of all the houses affected by the wind farm in Kipeto. He reiterated that people should not go on a spree to build house just because KEL was going to build advanced houses. The survey KEL has done has all the record including pictures of the structures we intend to replace including the value placed on them.
14. **Question 04:** What will happen to me if I have already paid and contracted a builder to do my house after KEL has done the survey.
15. Simon asked the concerned youth to hold on till the project directs him where he can safely build the house as the pastor Saitaga had the map showing the areas he can safely build. This will save him some money as there was no crime holding his development for a few months just to do it right.
16. Simon insisted that the IFC policy on indigenous people was against drastically changing these peoples life style by bringing modern structures and way of life. The social fibre of the Masai people is upheld by their way of life including the structures like Manyattas and cattle enclosures "Bomas". He asked the meeting to agree to build the Manyattas in the new sites where the houses will be constructed. The neighbourhood will not feel neglected and isolated when they can find traditional structures still in existence within the new sites with modern buildings. The meeting was impressed by the interest of KEL to maintain the culture of the Masai. The landowners promised to maintain their culture including covering their cattle enclosures because they do not allow strangers to count their cattle.
17. The meeting promised Simon that they will be ready to sign the relocation agreement as soon as possible.

The meeting closed at 5:00 pm with a word of prayer led by Pastor Wilson Saitaga



Simon Mwacharo Guyo  
**Director**  
**Kipeto Energy Ltd**

# MEETING AT THE KIPETO TRANSMISSION LINE ROUTE WITH LANDOWNERS

Date: November 31 2013 at IMUTATIN

## Present

1. Dr Kenneth Namunje (KEL Director)
2. Simon Mwacharo Guyo (KEL Director)
3. Wilson Saitaga (CWEIL Liaison officer)
4. Ezekiel Nkanoni (CWEIL Liaison officer)
5. Letela Kimojol (TL landowner)
6. Noah Matura (TL landowner)
7. Jeremiah Matura (TL landowner)
8. Tubula Nairigany (TL landowner)
9. James Sekento (TL landowner)
10. Roimen Sekento (TL landowner)
11. Rhozen Sekento (TL landowner)
12. Anderson Nanka (TL landowner)
13. Matee Koitee (TL landowner)
14. Joseph Pelei (TL landowner)

## Agenda

1. Payment arrangement 10% and 90% for the wayleave landowners
2. Financial Close date of June 30 2014
3. The long stop date of December 31<sup>st</sup> 2015 and its implications on the wayleave agreements

## Minutes

1. The meeting was opened with a word of prayer by Pastor Saitaga at 3:30pm
2. Pastor Saitaga explained the purpose of the meeting.
3. Dr Namunje addressed the meeting on the issue of representation by advocates. He stressed that Kipeto Energy Limited is represented by lawyers IKM and the landowners need to have legal representation. Dr Namunje noted that there were two lawyers representing some landowners and IKM were already making sure that the agreement was acceptable to both parties. Dr Namunje stressed that the 10% was already deposited with our Lawyers IKM awaiting payment to the landowners. Dr Namunje reiterated that a surveyor had been appointed to walk the transmission line and put monuments to mark it as they requested. This was going to cost Ksh 700,000/= and will have to follow due process. He stressed that for those landowners who trust that KEL had done a fare job they should come forward and get their payment at IKM our

lawyers office.

4. Simon rose to the meeting stressing on the agreed FC date of June 30<sup>th</sup> which all the landowners accepted. He explained to the meeting that there will be no risks imposed to them. Actually KEL was carrying all risk which included the 10% it is paying to landowners now. In case the project falls off then it is KEL at a loose. He explained that the long stop date of December 31<sup>st</sup> 2015 is when the project is supposed to be online. If in any case Kipeto does not go online then the wayleave agreement will fall off with no recourse to any party. Simon asked the landowners to direct legal issues to their lawyers since there was no legal person in the meeting. Since they have appointed a lawyer then he/she has to do their work as they will be expecting payment.
5. Mr Jeremiah Matura (former Councillor) rose to thank KEL on how they have handled the issue with a lot of transparency. He said that the payments calculations were very clear and correct. He encouraged those who have no issues with the agreement to go ahead and get their 10% payment and the subsequent 90% afterwards since Kipeto Project was a blessing to the community. Those people who had issues with the agreement or their title deeds will be served later and not to halt the process.
6. Pastor Saitaga closed the meeting with a word of prayer at 6:00 pm



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KENYA

DATE: July 19, 2014

## Meeting with landowners at Esilanke Primary School on 18<sup>th</sup> July 2014

### In Attendance

1. Kenneth Namunje **CS**
2. George Njega **GE**
3. Simon Guyo **CS**
4. Winnie Kiboi **GE**
5. Samuel Mamia **GE**
6. Linda Obara **AIIM**
7. Dina Manitra **IFC**
8. Ezekiel Nkanoni **CS**
9. Wilson Saitaga **CS**
10. Kaaka Tirkolo
11. Kuka Dikirr
12. Luketa Pulei
13. Pelo Gusil
14. Miisia Sokorte
15. Nkanoni Nkukuu
16. Pose Dikirr
17. William Kasirimo
18. Sironga Ngabual
19. Mayion Turume
20. Pitana Ngabual
21. Joseph Nkanoni
22. Wuapi Sialala
23. Makala Kadipo
24. Moses Pulei
25. Benjamin Saitaga
26. Stephen Somoine
27. Kuya Koitee
28. Benjamin Gusil
29. Solomon Pulei
30. Stephen Lerionka
31. Isack Ngabual
32. Tikoye Kiria
33. Matee Koitee
34. Nkadaro Mamitu
35. Joseph Kaaka
36. Joseph Moroyian
37. John Moroyian
38. Samuel Kaaka
39. Simangua Nkukuu
40. Wilson Kereya
41. Jeremia Kompo
42. Beatrice Saitaga
43. Joyce Saitaga
44. Eliza Mutunkei
45. Jackline Risa
46. Johana Kasirimo
47. Leteila Nkukuu
48. Micheal Matura
49. Senter Matura
50. Kimpei Saisoo
51. Pimpoi Tuukuo
52. Lankoi Nkukuu
53. Kayiok Nkukuu
54. Tanin Kirinkai
55. Kosianto Ngabual
56. Ngoto Jeremiah Kompo
57. Lekuka Nkanoni
58. Mure Miisia
59. Maranya Mamayio
60. Kesema Kadipo
61. Kaanto Turume
62. Kooya Sankaire
63. Tiyies Kereya
64. Rakua Sankaire
65. Hannah Dikirr
66. Peter Dikirr
67. Benja Kuka
68. Naneu Saringe
69. Sayiomet Letoya
70. Mpasianny Serpepi



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71. Letuya Kudate  
72. Kikanae Karu  
73. Sankale Kudate  
74. Naomi Kaaka  
75. Samuel Tepela  
76. Kayiok Lemeria  
77. Joseph Tepela  
78. Ngoto Tepela

79. Esther Parsapiyio  
80. Joel Pulei  
81. Parmuat Kereya  
82. Ateti Kosen  
83. Saitet Sekento  
84. Benson Kuya  
85. Joseph Ntari

## **Agenda**

- a. Project report – time lines, GEs new role, achievements
- b. Introduction of AIIM, IFC
- c. Deed of Variation registration; 500m buffer zones
- d. Kipeto Trust
- e. Youth issues
- f. AOB

## **Translators**

- Ezekiel Nkanoni
- Wilson Saitaga
- Joseph Nkanoni
- Joseph Morroyian

## **Minutes**

1. The meeting started with a word of prayer led by Pastor Wilson Saitaga
2. Pastor Wilson Saitaga welcomed everyone to the meeting especially Mr George Njenga of GE after so long. Wilson invited an elder from the wind farm Mr Willian Kasirimo who welcomed all the visitors and friends to Kipeto. He was hoping for a good report from CS, GE, IFC and AIIM since they had made sure things are going on well on their side.
3. Pastor Wilson also invited an elder from the Transmission line Clr. Jeremiah Matura. Mr Jeremiah thanked everyone for attending the meeting. He recognized that the project has many phases being present today with other landowners from the wind farm. He pleaded to the organizers to set



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the next meeting in a central area like Endarau primary school. There were landowners from both extremes.

4. Simon was invited by Pastor Wilson to take the meeting forward by introducing the new faces. Simon introduced the team from CS, GE, IFC and AIIM. Present were George Njenga from GE and Dr Namunje CS who started the project from the first meetings in 2010. Dina Manitra from IFC, Linda Obara from AIIM, Winnie Kiboi and Sam Mamia from GE. Sam Mamia is a son from Kipeto who is on internship at GE. GE had made a promise to the community to take the brightest student from the community.
5. Dr Namunje was invited to speak to the meeting. He invited George to greet the meeting. George Njenga was the first link for KEL between CS and GE. Dr Namunje thanked God for how far the project had gone having started from a meeting between Simon of CS and George of GE in a Climate Change Conference arranged by IFC.
6. Mr George Njenga greeted the meeting after a long time since we held our first quarterly meetings. He said that GE took a long journey with CS and the landowners and now has new faces in the project who are investors. Kipeto is a good project from the feasibility study done by GE. Project like these need big investments. GE is a technology company which invited IFC which is part of the World Bank. IFC funds many projects in Kenya and Africa. IFC did a due diligence on KEL and found it was a good investment. GE, CS and IFC later invited AIIM who manage funds for many parties all over the world and invest them in good projects. AIIM found KEL to be a good project and decided to join the team. The GoK is very supportive on KEL project as has put it as part of national projects contributing to 5000MW targets.

George said that project like KEL is based on trust and truth which is the way the Masai community operates. Since he has relations with the community he understands the Masai culture.

7. Dr Kenneth Namunje thanked on community for their trust on KEL. He mentioned that much of the Deed of Variation process was complete. He thanked the Ngong Deputy County Commissioner for having registered 43



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titles. Dr Namunje had made sure he came with the original title deeds to the meeting to give them back to the landowners. The 12 which were left were on course considering that Kilonito part of the wind farm had a different land board which sits in Kajiado. Dr Namunje told the meeting that a lot of progress had been achieved in Nairobi. KEL had been negotiating with KPLC on the PPA. There other negotiations around the Isinya Substation, Nairobi-ring transmission facility. Other arrangements were centered on EPC, TSA and FSA. Land issues including acquiring the TL and applying for building permits and making sure that all the development works were completed. The lender OPIC and Equity partners had to be comfortable with the project before funding it. He said that the project was targeting a December OPIC board. OPIC was going to fund 70% while Equity partners will do the 30%. This will not be easy and we all have to work very hard.

He urged the Wayleave landowners to come sign the agreement. He said that Belcom had surveyed the 500M buffer zones already though they were problems in certain areas where landowners had not been properly informed. He said KEL conducted this survey to know who are affected and find a way to compensate them. KEL was waiting for the surveyors report.

8. Dina Manitra from IFC greeted the meeting and being the first IFC staff to address the landowners she defined who IFC is and their role in the project. She said IFC funds many projects in many countries. KEL was a good project and would like to see IFC standards adhered and people affected to be fairly compensated. IFC is handling the Kipeto Trust which is 5% share of the project company. IFC has brought in two specialists to setup the Trust. These specialists will consult the community and the landowners in liaison with the county government to decide on community projects. There will be bi-monthly workshops with landowners. The community trust will start after January 2015. Dina will be in charge of following up progress.
9. Linda Obara from AIIM greeted the meeting and thanked everyone for being present. She introduced AIIM to the landowners; they manage funds for governments and other parties and invest these funds in good projects in infrastructure. They invest in projects like roads, airports, ports etc. GE welcomed AIIM into Kipeto last year. She reiterated that Kipeto is a good



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project and asked the landowners to work with the KEL team to finish the project.

10. Winnie Kiboi of GE was introduced by Dr Namunje. She thanked the Landowners for attending the meeting.
11. Samuel ole Mamia from GE was introduced to the meeting. He talked in Masai and told the meeting that he was one success promise by GE. He works as an intern in GE under George Njenga. After finishing University degree in Electrical Engineering GE had promised that they will support the brightest student from Kipeto. He told the Youth that GE and KEL were host people and had the project at heart.
12. Pastor Wilson Saitaga the thanked the speakers for the updates which were timely. He thanked the landowners from the wind farm and the transmission line for attending. He was comfortable because the meeting had cleared rumors that GE was no longer in the project and that the US government was not going to support Kenyan projects due to the Chinese entry. The Pastor also thanked landowners who were affected by the 500M buffer zones and were present in the meeting. He insisted that the project belonged to all of us.
13. During Q&A time many landowners rose to talk about the 500M buffer and that its effect was much bigger in reality on the ground. Mr David Torome, David Kuya, Uwapi, Pelo Gusil, John Kaaka, Jacqueline Risa, Joseph Nkanoni and Mzee Nkanoni asked what the project will do for the homes pushed into inhabitable areas. They were concerned that the actual ground 500M had taken most of their land. Their neighbours who were not in the project were affected by the buffers. They also complained that the surveyors came to their land without notice hence they chased them away in certain instances.
14. Dr Namunje was at task to answer the landowners concerns. He pleaded with the landowners to forgive KEL for the surveyor's misconduct. He said the survey work had to be done to ascertain who was affected by the 500M buffers and how far they were going. As it was a NEMA condition KEL had to perform. Since the landowners affected by this effect were fewer; he



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asked them that their cases will be visited individually. KEL was waiting for the Surveyors report to ascertain the effect and due compensation.

15. Simon reiterated that the project has the task to find out who are affected and determine their compensation. He said that he visited all the 500M buffer ground markings with Tony van Engelen and took details of the landscape in order to educate the KEL team on this effect. KEL has since the start of the project invested a lot of resources and expertise to come up with the turbine layout. Therefore the House locations are all logged on a digital map and are known. KEL was not going to move people into inhabitable areas; thus the purpose of meeting landowners and surveying the land. With GE, IFC, CS and AIIIM on board nothing is going to be left to chance hence the project will be done according to the law of the land. He discouraged those who felt like leaving the project because turbines on their land were affecting their neighbours. KEL will do its task and compensate fairly where the effect of the wind farm is felt including building houses for the most affected in safe areas.
16. Mr George Njenga urged for sobriety and oneness in the project. He reiterated that KEL considered the landowners of Kipeto as partners. He insisted that Trust is what has built this project to what it is today. Suspicion of one party to the other is only going to help if it is productive unless the landowners feel totally cheated and want out. Projects are about problems and challenges and KEL is not exempt from these realities. Landowners and KEL have to work as a team in this long journey. Even good projects like Kipeto can be brought down by rumors and bad relationships. The truth about the realities of challenges has been stated by KEL from the beginning hence seeking cooperation from the teams is crucial. Those who fear and run away from challenges never succeed in life and success doesn't come easy. KEL has to sort out several tasks as a project in order to satisfy the lenders. The project is expensive thus it has to look for funding from Banks and lending institutions. George gave his own experience in Nigeria and that these issues were not unique. Projects have to look for solutions to challenges. Where mistakes have been done people have to forgive one another and walk the journey.



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17. The meeting was closed with word of prayer by Pastor Wilson Saitaga at 5:15pm
18. The Kipeto Youth engaged KEL in their concerns after meeting. Dr Namunje and Simon addressed the youth and asked for their active participation. KEL regretted that Youth were coming late in the project yet they are the future of Kipeto. In several meeting held by KEL and other stakeholders the youth have either been absent or voiceless. Yet their parents would require them to explain issues in the leases. The youth present felt left out of the picture. They wanted to understand the project economics and the gist of what their parents agreed on the project. The pertinent issues the youth were bringing up have to be dealt in a youth meeting which was agreed to be held on August 30<sup>th</sup> 2014 time and venue to be communicated.
19. Lunch was served as participants feasted away into the sunset of the evening of 18<sup>th</sup> July 2014 at Esilanke Primary School.

By

Simon Mwacharo Guyo  
**Director**  
KEL



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KENYA



Mr George Njenga addressing the meeting



Women in attendance



Mr George Njenga with Mr Simango Nkukuu



A section of the meeting



Doc, Linda AIIM and Dina IFC



Esilanke Primary school

DATE: June 28, 2014

Meeting with Transmission Line Landowners held on the 28<sup>th</sup> June 2014 at Kipeto Endarau Primary School grounds

**PRESENT**

1. Dr Kenneth Namunje (KEL)
2. Simon Mwacharo Guyo (KEL)
3. Pastor Wilson Saitaga (CS)
4. Ezekiel Nkanoni (CS)
5. Kosek Sekento
6. Nasha Lomereta Koitee
7. George Tobola Nairigyan
8. Letela ole Nkanoni
9. Joseph ole Torome
10. Pilon ole Sorkote
11. Manati ole Nairigyan
12. Jama ole Koitee

**ABSENT WITH APOLOGY**

1. Jeremiah ole Matura
2. Dr Anderson Nanka
3. Christian Caldara
4. Kilamu ole Mupeni
5. Kalaile and Kanati Kunyinyi
6. Sanayian ene Nterere
7. Maranya Mamaiyo
8. Tupana ole Ngoiya Nengolek
9. Mamaiyo
10. Ntari Sokorte
11. Richard Saire
12. Sangingo ole Gussil
13. Katiany
14. George Sekento
15. Kasaine ole Pulei Kinyoei
16. Peter ole sadera
17. Muico company ltd

**MINUTES**

1. The meeting was opened with a word of prayer by Pastor Saitaga
2. Pastor Saitaga introduced the main agenda of the meeting being the wayleave signing and outstanding 90% payment for the already signed landowners
3. Dr Namunje told the meeting that the project had progressed very much and was at the final negotiations with KPLC on the PPA. The land acquisition was a major component in meeting the bank (lenders) requirements. Though much progress had been made on this direction a lot of work still remained. He urged the landowners to encourage those who were yet to sign to come and sign the wayleave since the Surveyor had marked the line already. The 90% payment was pegged on the fact that we have to acquire all the wayleaves plus other necessary documents for the OPIC committees.
4. Mr George Tobola Nairigyan rose to express the frustrations of the landowners blaming KEL of not meeting their promises and timelines. He said that the landowners were waiting for the 90% balance by end on June 2014; failure to that the landowners would withdraw from the agreement. He blamed the lawyers for not being at the meeting and

felt cheated on his land. He told the meeting that all the landowners were represented in their decision he was delivering to KEL.

5. Mr Joseph Torome rose to stress on the same frustrations with KEL. He said that KEL is not able to keep promises and cannot be trusted. He did not wish to hear another false promise. He said if KEL was unable to do the project; they should tell the landowners.
6. Dr Namunje rose to explain the reason for delay of FC. He told the meeting; though we had done a lot so far now was the critical time where we check everything required by the lenders. Kipeto 100MW project is a big project with a national effect. It is part of the vision 2030 flagship projects the government is like everyone KEL has to get a loan to build the project and the lender has requirements for such a transactions. Also the landowners are to blame for not signing their wayleaves while the money was sitting at IKM for over 8 months now. He begged the landowners not to take the route of opting out of the project since there were more benefits in this project and for the whole country.
7. Mr Simon told the meeting that matters to do with the agreement and law farms involve money. There are clauses within the agreement which govern exit, FC and alike. These have to govern every conversation to do with the wayleaves. He reminded the meeting that the same landowners pushed KEL to give an indicative date for FC. He told the meeting that under the circumstances it was a tricky question and KEL gave an estimated date of June 2014. This was estimated with the prevailing speed at which the project was progressing. This date was never put in the agreement. Hence it was also trickery for the same landowners to demand payment of the 90% outside the signed wayleave agreement. He said also that the wayleave agreement had no relationship with any debts a landowners was going to incur after signing it apart from the 90% at FC. If a landowner was going to borrow money or stock using the wayleave as collateral; then there was never going to be any connection with the document since it was the word of the landowner and their debtor. KEL could only ask for the landowner to cooperate and finalize on the project. He also pleaded with the landowners to stay in the project and help bring to board the rest of the wayleave.
8. Mr George Tobola Nairigyan rose to stress that they needed a firm promise for FC. He also noted that the wayleave did not have even a date for FC and this was trickery from KEL. The next promised KEL should not jump on it because it will ruin the relationship.
9. On another personal matter Mr Letela Nkanoni of plot 1570 told the meeting that he needed his case to be treated special. His plot's affected area was small and the money he would get as 10% was only Ksh 50K. He said his title was held by a farmer's local bank AFC (Agricultural Finance Corporation – *see attached letter*) for a Ksh 220K. He asked KEL to consider a higher percentage for his first payment in order to pay the loan and release the title deed hence sign the wayleave. The money will be paid direct to AFC.

10. Dr Namunje promised Mr Nkanoni that he will take the matter to the Share Holder to consider. He said that the project sometimes had to handle such cases in order to progress. Dr Namunje told the meeting that from the project managers report the FC stood at the end of the year. This meant that everyone had to work pretty hard to satisfy the lenders who will then give assurance that the project is on.
11. Mr Ezekiel Nkanoni and Pastor Saitaga engaged the landowners for a while in their local language to reason with them on the issues of monies, their commitment, expectations and way forward. After a moment of deliberations the landowners declared they will stay in the project but KEL keep the December 2014 FC. The Elders also agreed to support KEL get the other plots along the TL signed up.

Meeting closed with a word of prayer at 6:30pm





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**Limited**

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**P.O. BOX 57357 CODE 00200**  
**NAIROBI,**  
**KENYA**

**AGRICULTURAL FINANCE CORPORATION**

TELEPHONE: 045-21139, 020-238868  
EMAIL: afckajiado@agrifinance.org



KAJIADO / MAIN TOWN ROAD  
P.O. BOX 63 - 01100, KAJIADO

AFC/KJD/RIM NO. 41038

**TO WHOM IT MAY CONCERN**

**17/06/2014**

Dear Sir/Madam,

**RE: LR NO. KAJIADO/KIPETO/5155**

We confirm that we hold the above title deed registered in the name of Letela Ole Ngukuu Kimanjoi, which was used to secure a loan of Kshs 300,000/= the outstanding balance as at 17/6/2014 is Kshs 220,000/=.

Any assistance accorded to him will be highly appreciated.

Yours faithfully.

*for Atteree*

**IRENE S. MUNYIRI (MRS)**  
**BRANCH MANAGER- KAJIADO**

ISO: 9001:2008 CERTIFIED



Minutes of MeetingNo: 01

<b>Contract No:</b>	<b>Venue:</b> Esilanke Primary School	<b>Meeting Date:</b> August 30 <sup>th</sup> , 2014	<b>Prepared by:</b> SG
<b>Purpose:</b>	<b>Minutes of Progress Meeting</b>		
<b>Attendees:</b>	<p><b>County Administration</b></p> <ol style="list-style-type: none"> <li>Chief Francis Nguitiko</li> </ol> <p><b>Kipeto Youth representatives</b></p> <ol style="list-style-type: none"> <li>Joseph Kadipo – Chairman</li> <li>Joseph Nkanoni – Youth Agenda Representative</li> <li>JeremiaSankaire – Senior Member: Assistant Chief (Oloyiankalani Sub-location)</li> <li>Kipeto Youth (separate list)</li> </ol> <p><b>IFC representatives</b></p> <ol style="list-style-type: none"> <li>Nicholas M. Holdcroft</li> <li>Elizabeth Schroen</li> </ol> <p><b>AIIM representatives</b></p> <ol style="list-style-type: none"> <li>Tony van Engelen</li> <li>Linda Obara</li> </ol>	<p><b>CWIEAL representatives</b></p> <ol style="list-style-type: none"> <li>Dr. Kenneth Namunje – Chairman</li> <li>Simon Guyo – CEO</li> </ol> <p><b>KTL representatives</b></p> <ol style="list-style-type: none"> <li>Sanjay Gandhi – ESIA Team Leader</li> <li>Joel Omondi – Sociologist</li> <li>Elvis Obok – Lawyer representing Professor Albert Mumma</li> </ol> <p><b>Community Liaison Officers</b></p> <ol style="list-style-type: none"> <li>Pastor Wilson Saitaga</li> <li>Ezekiel Nkanoni</li> <li>Mzee Paul Kipapeyi</li> </ol>	
<b>Apologies:</b>	1. None		
<b>Distribution:</b>	To All Attendees		

Item	Description
	<b>INTRODUCTION</b>
1.	<p>The meeting was called by the Youth living within the project footprint area and included the sons of land owners in the wind farm and transmission line area.</p> <p>The meeting commenced at about 11.00 AM with introductions by different stakeholders represented in the meeting. The meeting was then opened by Pastor Wilson Saitaga who gave a background of the desire of the Kipeto youth for a meeting.</p> <p>Subsequent to the above, Wilson invited Dr. Namunje who provided the history of the project. Dr. Namunje used a Background Information Document (BID) to enumerate the history.</p>
2.	Dr. Namunje highlighted some of the attributes of the Kipeto Wind Energy project which are described below.
2.1.	<ul style="list-style-type: none"> <li>The Ministry of Energy granted CWIEAL First Rights of Refusal in 2009;</li> <li>In the same year, General Electric (GE) invested in the project and a special purpose vehicle (SPV) called Kipeto Energy Limited (KEL) was formed. The SPV shareholders were GE (70%), CWIEAL (25%) and the Community (5%);</li> <li>The first land leases were signed on January 24, 2011 and to-date, KEL has signed 60</li> </ul>

Item	Description
	<p>leases with land owners</p> <ul style="list-style-type: none"> <li>• The contract for construction of the wind farm and transmission line has been awarded to Iberdrola Engineering and Construction of Spain</li> <li>• Construction is expected to commence in Q1, 2015;</li> <li>• OPIC is providing the full debt for the project;</li> <li>• Equity for the project is 30% and debt, 70%</li> <li>• PPA negotiations with KP&amp;LC commenced on June 4, 2012; in principal KP&amp;LC has agreed to the PPA with KEL;</li> <li>• The transmission line must be commissioned before March 31, 2015 and KP&amp;LC requires this commitment from KEL to sign the PPA;</li> <li>• The PPA states that there will be curtailment of power between 1:00am and 5:00am daily. The WTG have a capacity factor of 50% and it is anticipated that the wind farm will be producing power for 6 months in a year. The FIT for the wind farm is 12US Cents/KwH;</li> <li>• Each WTG is named and based on wind data, KEL knows the amount of power each WTG will generate;</li> <li>• There is a 1.4% payment which will be effective from first year of commercial operation.</li> <li>• The first priority for all jobs will be given to the people living within the wind farm and transmission line footprint area. All security related jobs will go the local Maasai community;</li> <li>• In two weeks from this meeting, a fully furnished container will be placed at the Esilanke Trading Center for the community to be educated about the project and also allow them to raise their grievances.</li> </ul>
3.	<p>After Dr. Namunje provided the above outline, Pastor Wilson said that the youth present were from various parts of the wind farm and transmission line areas of Kilonito, OINDonyoSidai, Esilanke and Enarau.</p> <p>Given below are the issues raised by the youth at the meeting</p>
	<p><b>ISSUES RAISED BY THE YOUTH</b></p>
4.	<p>Pastor Joseph Kadipo – Chairman of the Meeting and Youth representative (his father is a land owner)</p> <ul style="list-style-type: none"> <li>• He informed the meeting that the youth had developed an agenda for the meeting which includes: <ul style="list-style-type: none"> <li>✓ The role of the youth in the Kipeto wind farm project</li> <li>✓ The available job opportunities for the youth - can a database of all those opportunities be availed to them? Can they be advised on what to train in line to the needs of this project?</li> <li>✓ The Compensation policy of the Landowner; what are the key drivers of the compensation policies? Expound more on what was considered while allocating 1.4% of Turbine gross revenue generated to a landowner?( This because the current International rate for compensation of land owners is in the range of 2.5%- 4%) , Relocation compensation, Disturbances allowances to those neighboring the Turbines?</li> <li>✓ The legal Procedure of doing key amendments to the lands leases clauses.</li> <li>✓ The project development phases progress updates;</li> </ul> </li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>✓ The community Trust deed development- youth key roles and input in policies formulation</li> <li>✓ Relocation impacts on the community residents- especially the Buffer zone impact feedback</li> <li>✓ Collateral for the Financiers of the project- has the KEL used the landowners Parcels as the security? And what happen when there is a default of loans repayment to our lands?</li> <li>✓ Community Liaison person(s) being biased in passing the information, they only Involve the old man of the family and segregate the youth in key decisions that touch on land- Youth suggest a committee that's inclusive of all genders to work with the current community Liaison person(s).</li> </ul> <ul style="list-style-type: none"> <li>• He requested KEL to provide responses to the above agenda items and going forward, considerand incorporate the issues raised them into the project.</li> <li>• He said he was chosen as the Chairman of the Youth Group. He further said that the above agenda was developed for the wind farm and did not include issues associated with the transmission line project. He did say that there were youth representatives associated with the transmission line present and that they would raise their issues when given an opportunity to speak.</li> <li>• After saying the above, he handed over to Mr. Wilson Kerea who was representing youth from the Kilonito area of the project to say something.</li> </ul>
5.	<p>Wilson Kerea – youth representative from Kilonito area</p> <ul style="list-style-type: none"> <li>• He welcomed the KEL team and said that the persons present from the project company were not new to the project area.</li> <li>• He further said that the project had commenced 4 years ago and therefore they were fully aware of it.</li> <li>• He went on to say that the youth are aware that KEL had already signed leases for the WTGs</li> <li>• He said that the project had been transparent and that Dr. Namunje and Simon Guyo were effective in resolving issues.</li> </ul>
6.	<p>Joseph Kunyinyi – Transmission line representative</p> <ul style="list-style-type: none"> <li>• He said that there were agreements for payments to be made but that this had not happened</li> <li>• He said that the execution of the agreement should be done as had been agreed initially</li> <li>• The progress in the transmission line project is good and there are currently no issues</li> </ul>
7.	<p>Francis Nkoitiku – youth representative from OINDonyoSidai</p> <ul style="list-style-type: none"> <li>• He said that the project was not new to them and that their fathers had signed leases for the project;</li> <li>• He said that the youth from his area are fully supporting the project</li> </ul>
8.	<p>Joseph Nkanoni – youth representative from Esilanke</p> <ul style="list-style-type: none"> <li>• He said that his family is a significant beneficiary of the wind farm project;</li> <li>• He said the objective of the meeting was to share knowledge and learn from one another;</li> <li>• He said that the agendas the youth had proposed were not meant to stop the project or for it to go the same route as the Kinangop Wind Park. Instead the objectives of the</li> </ul>

Item	Description
	<p>agendas were to request KEL to consider issues raised by the youth and advise them on what can be edited or changed, or, what is possible and what is not.</p> <ul style="list-style-type: none"> <li>• He further said that if this particular meeting was insufficient to address the youth issues, they were willing to organize additional meetings to iron out the issues</li> </ul>
9.	<p>Joseph Nkanoni was requested to ask the questions raised in the agendas.</p> <ul style="list-style-type: none"> <li>• He enquired how the original lease agreement was developed. He said that after reading the agreement, the youth wanted clarification on the following: <ul style="list-style-type: none"> <li>✓ Does the lease agreement recognize other family members such as the wives?</li> <li>✓ What would happen to the agreement if the project collapses at some stage?</li> </ul> </li> <li>• Dr. Namunje responded by saying that prior to finalizing and signing the lease agreement, there were several stakeholder consultation meetings in which the parents of the youth had their chosen lawyer (Mr. Lucas Naikuni) present to explain each clause. Lucas Naikuni represented the land owners. Dr. Namunje said that it would be appreciated if the youth would raise specific issues that they have with the signed lease agreements.</li> <li>• Dr. Namunje clarified that KEL is only leasing the WTG footprint area (defined in the extension of land use application to lands board) and not the entire plot. He said that the existing land use is classified as agricultural which does not attract any taxes. However, as the WTG footprint is not agricultural, it is best to apply for an “extension of use” from the Kajiado County Government; an extension of use does not permanently change the land use for the WTG footprint area and will revert to agricultural use when the wind farm is decommissioned at the end of its useful life.</li> </ul>
10.	<p>Joseph Nkanoni then asked the following questions:</p> <ul style="list-style-type: none"> <li>• Will there be compensation for environmental destruction that will take place during the construction phase?</li> <li>• How was the figure of 1.4% arrived at?</li> <li>• He suggested that 5% should go to the land owners and 1.4% should go to the community.</li> </ul> <p>Dr. Namunje’s responses are given below.</p> <ul style="list-style-type: none"> <li>• Dr. Namunje said that it was agreed in the beginning with the land owners that they will receive the following payments for access of their land during feasibility study and construction of the wind farm <ul style="list-style-type: none"> <li>✓ KShs 100,000 for those with a parcel of land up to 100 acres;</li> <li>✓ KShs 150,000 for those with parcels of land ranging from 101 – 150 acres; and</li> <li>✓ KShs 200,000 for those having parcels of land &gt;200 acres</li> </ul> </li> <li>• With respect to the 1.4%, Dr. Namunje said that: <ul style="list-style-type: none"> <li>✓ This percentage will be applied to the gross revenue generated by each WTG. He also said that the capacity factor is about 50%;</li> <li>✓ Based on their calculations, the average revenue per WTG is approximately US\$13,000; and</li> <li>✓ The project has a payback period of about 17 years</li> </ul> </li> </ul>
11.	<p>Pastor Wilson Saitaga then rose and commented that the land owners who are receiving WTGs had “sponsored” the project and supported it from its inception. Subsequently, they should be given priority in matters related to the formation and operation of the Community</p>

Item	Description						
	Trust.						
12.	<p>Joseph Nkanoni suggested that the youth should set up a committee made up of both genders to manage the operations in the containerized office to be set up at the Esilanke trading center. He said that the youth would agree on the modalities of setting up such a committee.</p> <p>He said that the above committee would not be permanently employed but would meet regularly to iron out any issues and promote the project. If this was acceptable, KEL could consider providing a sitting allowance for the committee.</p> <p>He said that Pastor Wilson Saitaga and Ezekiel Nkanoni had so far done an excellent job as CLOs and the youth appreciated their work.</p>						
13.	<p>David Ngiringai – Assistant Chief</p> <ul style="list-style-type: none"> <li>• David is part of the County administration.</li> <li>• He said that he is part of the youth and his parents are land owners that are getting WTGs on their land.</li> <li>• He reiterated what Pastor Wilson Saitaga said that the land owners who supported the KEL project from inception should have greater role in the management of the Community Trust</li> <li>• On the 1.4% f gross revenue, he suggested that KEL should include an escalation clause of this percentage based on the inflation rate.</li> </ul>						
14.	<p>Daniel Kirinkai – Area Chief</p> <p>As the senior county administration leader present at the meeting, he was given an opportunity to make a few comments. His remarks are given below.</p> <ul style="list-style-type: none"> <li>• He appreciates that KEL decided to invest in their area.</li> <li>• He said that the parents of the youth should be invited in future meetings</li> <li>• He requested KEL to consider erecting an office for him to serve the community better.</li> </ul>						
	<b>A.O.B</b>						
15.	There was no AOB and the meeting closed at 5:00pm						
	TBA						
	<table border="1"> <tr> <td><b>Date:</b></td> <td>TBA</td> <td><b>Venue:</b></td> <td>TBA</td> <td><b>Time:</b></td> <td>TBA</td> </tr> </table>	<b>Date:</b>	TBA	<b>Venue:</b>	TBA	<b>Time:</b>	TBA
<b>Date:</b>	TBA	<b>Venue:</b>	TBA	<b>Time:</b>	TBA		

## KIPETO YOUTH MEETING 30<sup>TH</sup> AUGUST 2014

### ATTENDANCE LIST

1. Tony van Engelen	KEL	39. Joseph Kunyinyi	0725-431110
2. Paul ole Kipapei	CS	40. Benjamin Kosen	0727-932575
3. Chief Jeremiah	ESILANKE	41. KanatiKunyinyi	0722-142850
4. Sanjay Gandhi	KURRENT	42. Daniel Tiram	0710-577215
5. Dr Kenneth Namunje	CS	43. Solomon Masek	0728-298875
6. Simon M Guyo	CS	44. Samuel Sankaire	0724-708479
7. Mary Arende	GE	45. Silas Kuka	0727-149739
8. Nick Holdcroft	IFC	46. Richard Letuya	0707-446255
9. Libby Schroenn	IFC	47. Joseph Morroyian	0714-448716
10. Linda Obara	AIIM	48. Daniel Nkanoni	0729-213531
11. Lawyer	Prof Muma	49. Jackson Nkanoni	0714-539106
12. Joel Omondi	KURRENT	50. Peter Kamau	0704-716014
13. Pst Wilson Saitaga	CS	51. Joel Kamau	0703-428086
14. Ezekiel Nkanoni	CS	52. Benjamin Kuka	0726-419027
15. William Kerea	0720-839781	53. Linteilemeria	
16. Pst Joseph Kadipo	0724-718974	54. Mathew Kadipo	0723-539042
17. David Kurash	0721-785022	55. Peter Somoine	0725-065725
18. Stephen Lerionka	0727-235422	56. Benjamin Kurash	0716-563800
19. Moses Somione	0712-698915	57. Simon Kasirimo	0724-888466
20. Moses Kerea	0724-867402	58. Pose Kaaka	
21. Noah Lantei	0714-539109	59. Chief Daniel Kirinkai	
22. Joel Saitaga	0720-946697		
23. BenardKurash	0720-213150		
24. Jacob Tepela	0725-779229		
25. Jeremiah Kurash	0702-241203		
26. Collins Saitaga	0728-966390		
27. Samuel Kaanto	0703-828293		
28. Samuel Nkanoni	0710-605639		
29. Wilson Mayan	0725-086562		
30. Jackson Mamitu			
31. William Tiram	0724-688542		
32. Benjamin	0712-758614		
33. Joel Sankaire	0713-471523		
34. JacklineRisa	0710-233892		
35. Joyce Teto	0726-932968		
36. Francis Nkoitiko	0723-614914		
37. Joseph Miisia	0723-041449		
38. Samuel Mamia	0721-993531		