GC GREEN EXCELLENCE LIMITED
A 10 MW Solar Power Project
Business Plan

Submitted to:

Executive Director

Tanzania Investment Center

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1 Executive Summary

This project business plan has been developed to provide a summary for the proposed investment of a 10 MW solar project at Mkinga district under the Small Power Producer Framework (SPP rules). As per the SPP rules, the project shall connect to the National grid and improve power stability in the district and region at large. This business plan shows various milestones completed and value proposition for the Proposed Mkinga solar project and delineates the future activities to project operation. Furthermore, this business plan outlines the development of a 10MW solar power plant with the intention of selling power to the Tanzania Electric Supply Company Limited (TANESCO) under a Power Purchase Agreement (PPA) at an anticipated rate of 7USc/kWh for a term of 20 years. The project aims to provide clean, reliable, and affordable electricity, supporting Tanzania's renewable energy goals while ensuring financial sustainability and profitability. The project will contribute to the reduction of CO2 emissions by approximately 15,000 tons per year. In addition to contributing to Tanzania's renewable energy targets.

1.1 Demographics

Tanga Region is one of Tanzania's 31 administrative regions. The region covers an area of 26,667 km2 (10,296 sq. mi). The region is comparable in size to the combined land area of the nation state of Burundi. Located in northeast Tanzania, the region is bordered by Kenya and Kilimanjaro to the north; Manyara region to the west; and Morogoro and Pwani regions to the south. It has a coastline to the east with the Indian Ocean. According to the 2022 national census, the region had a population of 2,615,597.

Mkinga District is one of eleven administrative districts of Tanga region. The district covers an area of 2,712 km2 (1,047 sq. miles). The district is bordered by Tanga district to the southeast and Muheza district to the southwest. On the east the district is bordered by the Indian Ocean. On the west is Korogwe and Lushoto districts. On the north the district borders Kenya. According to the 2022 Tanzania National Census, the population of Mkinga District was 198,065.

Tanga is one of East Africa's largest agricultural producers, especially Citrus fruits. Agriculture is the biggest employer in Tanga Region. The coastal belt 0-15m above sea level covers most of Pangani district, a small coastal strip of Muheza district, Tanga and Mkinga districts. Crops grown in this Tanga coastal belt are coconuts,

sisal, cashews, maize, cassava, rice, and seaweed Crops grown in the wet plains of Tanga are similar to the coastal belt minus the seaweed but include cotton.

1.2 Solar Potential

Tanzania has promising levels of solar energy potential, ranging between 2,800 and 3,500 hours of sunshine per year and a global horizontal radiation of 4–7 kWh per m2 per day. In this regard, solar energy is one of the more viable sources of renewable energy for Tanzania. Currently, about 6MW of solar off-grid PV has been installed countrywide. The potential for grid-connected solar PV is estimated at 800MW. To date, a 1MW grid-connected PV plant has been commissioned generating about 1,800MWh/year.

2 Economic assessment & Policy

2.1 Socio – economic assessment

The economy of Tanga Region like in many other regions depends on subsistence agriculture, livestock keeping and fishing. Food production to a large extent is undertaken by small holders, while cash crop production is carried out by both small holders and large-scale farmers (public and private institutions). The leading and prominent food crops in terms of area coverage are maize, cassava, banana, pulses, mainly beans and rice. Important cash crops include sisal, cotton, coffee, tea, cardamon, coconuts, tobacco and cashewnuts. Livestock reared are cattle, goats, and sheep. Modern dairy farming and poultry keeping is not very common in the rural areas, although few do it.

2.1.1 Irrigation Schemes

Irrigation farming at Mkinga district is feasible and would greatly make up for the loss caused by seasonal and erratic rainfalls on agricultural production. The potential for irrigation programmes exists in Mtimbwani and some parts of Muheza. The district has irrigation potential of 30,000 hectares, of which only 4,500 hectares are effectively exploited.

2.1.2 Fishing

Fishing is another major livelihood activity for the people, along the Indian Ocean. Fishing provides food, employment, and income for many people in Tanga Region. There are about 45 major fishing villages along the Coast of the Tanga Region. Most of the people in those villages are entirely engaged in fishery and agriculture is carried out on a small scale only.

2.1.3 EACOP Pipeline

ACOP runs 1,443km from Kabaale, Hoima district in Uganda to the Chongoleani Peninsula near Tanga Port in Tanzania. Construction of the pipeline will attract a ripple effect on other economic activities such as hotel, blasting and increase the population at Mkinga district.

2.1.4 Industries.

According to official statistics Tanzania's industrial establishments were concentrated in Dar es Salaam and Coast Region. Tanga and four other regions (Mwanza, Arusha, Morogoro and Kilimanjaro) shared most of the remaining industries of the country. It is difficult to make an overall ranking, but in terms of employment Tanga was in third position behind Coast and Mwanza and in terms of numbers of establishments and of value added "second only to Coast".

The most important industries which boost the economy of Tanga Region included.

i. Tanzania Fertilizer Company: It is one of the biggest industries with employment capacity of 700 people and production capacity standing at around 85,000 tons of fertilizer per year.
ii. Cement Factory: Its production capacity is 500,000 tons per annum. The cement factories are supplied with TANESCO 33kV feeder from Kange Sub Station and would benefit from excess energy generated at the proposed Solar power plant which also connects at Kange SS.
iii. Fruit Canning Factory at, fully mechanized factory for processing and canning of mangoes, oranges, pineapples and sometimes grapefruits and passion fruits. It had a capacity of processing 1.6 tons of fresh fruits per hour.
iv. Sawmill at Mkata in Handeni District designed for the production of parquets floor-tiles from Mahuhu hardwood. It has employment capacity of 130 people.

Mkinga District is becoming an attractive and dynamic centre of economic activity. Indeed, the increased economic activity in the area and rapid development led to a population increase of the area by 21.3% between 2002 and 2012, and creation of a new separate Mkinga district from Muheza district in 2007.

As it is, with improved infrastructure to meet the demands of the incoming businesses and population growth, land prices, rental rates and other real estate costs will escalate, as demand for land in the district and surrounding areas will increase.

2.2 *National Energy Policy*

This policy promotes adoption of clean technology and minimises pollution in developing the energy sector in Tanzania. It emphasises utilisation of the natural energy resources such as solar and wind in a sustainable and environmentally friendly way. The Energy Policy provides guidance for sustainable development and utilisation of energy resources to ensure optimal benefits to Tanzanians and contributes towards transformation of the national economy.

The policy further enhances provision of adequate, reliable, and affordable modern energy services to Tanzanians in a sustainable manner and with due regard to gender issues.

The policy particularly addresses electricity supply by emphasising that the government will ensure sufficient and cost-effective energy supply to meet the increasing demand.

3 Proposed Project Overview

3.1 *Proposed Mkinga solar project*

The Proposed Mkinga solar project ("Mkinga Solar") is a 10 MW solar photovoltaic project that will generate power at Mtimbwani Village in Mkinga District, Tanga Region along Tanga – Horo Horo highway. The Proposed Mkinga solar project will feed into the Tanzania Electric Supply Company Ltd (TANESCO) main grid high-quality, affordable power with the interconnection point long Mkinga 33kV feeder line at Mtimbwani village.

The Proposed Mkinga solar project require a total area of 12 hectares. Upon undertaking a feasibility study to obtain more reliable data by measuring solar irradiation at the project site and improving the solar irradiation curve significantly, actual land requirements for a project capacity of 10 MW can be defined. The location of the project is shown below.

Figure 3.1 *- Location of Proposed Mkinga solar project*

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3.2 *Ownership structure*

3.2.1 GC Green Excellence Ltd

GC Green Excellence Ltd ("Green RE") is a subsidiary of Green Capital SA ("Green Capital SA"), Incorporated in the Republic of Tanzania. GC Green Excellence Ltd is a project Special Purpose Vehicle (SPV) for the development, construction, and operation of Mkinga 10 MW Solar project. Company Compliance documents are in Annex I

3.2.2 Green Capital SA

Green Capital SA ('Green Capital") is part of Sun Capital Polska group incorporated in Poland and contributes to the development of modern energy based on renewable energy. It builds, operates and sells energy from wind and photovoltaic farms. It also develops innovative hybrid projects that will produce green hydrogen as storage in the near future. With extensive experience in renewable energy development, Green Capital develops projects from inception to commissioning and operation in several African countries including Namibia, South Africa, and Kenya. Green Capital has committed funds to complete development activities for the Proposed Mkinga solar project. The funds will also provide up to $6M to cover all expected construction costs, subject to design optimization.

3.3 *Project land*

The project footprint, which includes all the envisaged project features, will cover an estimated area of 16 hectares and will make use of the existing expansion of associated access road from Mtimbwani Village to the project site. The project land is as shown below:

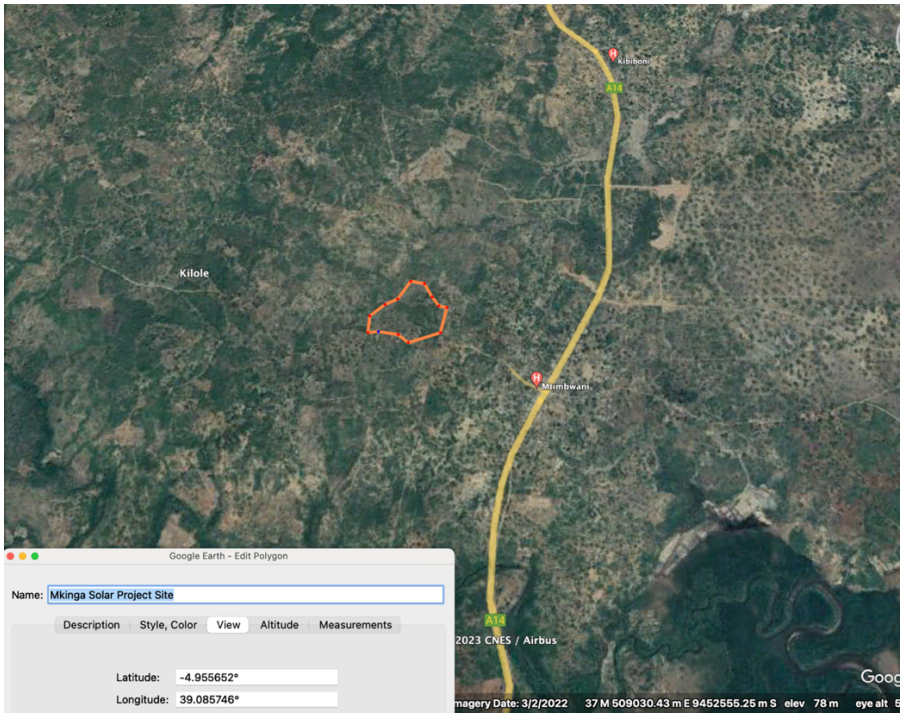

Figure 3.2 - Proposed Mkinga solar project site

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Boundary Coordinates (WGS 84)				
	Boundary Marks	**Nortings (mS)**	**Eastings (mS)**	**Description**
Site	S2-P1	9452402.00	508675.78	The total area is 16.2 Hectars and thea area is less than a km to the main road.
	S2-P2	9452532.00	508681.00	
	S2-P3	9452660.50	508879.92	
	S2-P4	9452778.87	509069.93	
	S2-P5	9452585.40	509240.30	
	S2-P6	9452273.92	509169.13	
Boundary Coordinates (UTM 1960)				
	Boundary Marks	**Nortings (mS)**	**Eastings (mS)**	**Description**
Site	S2-P1	9452710.00	508568.78	The total area is 16.2 Hectars and thea area is less than a km to the main road.
	S2-P2	9452840.00	508574.00	
	S2-P3	9452968.50	508772.92	
	S2-P4	9453086.87	508962.93	
	S2-P5	9452893.40	509133.30	
	S2-P6	9452581.92	509062.13	

Table 3.1 - Coordinates for proposed land

Green RE is seeking confirmation from the district council for availability of the project site for development, construction, and operation of the Mkinga 10 MW solar project. Following confirmation of site by TANESCO, Green RE will inform the council for further arrangements to facilitate project activities. Green RE remain supportive of any procedures necessary for the issuance of the support letter.

3.4 Sources of funding

3.4.1 Investment costs

The total investment cost for the Proposed Mkinga solar project is expected to be from different funding sources from Green Capital SA and its partners. Green Capital SA will continue to provide development funding for internal costs, development fees, administration costs, and other mid-late-stage development expenses.

3.4.2 Credit enhancement & Financial analysis

With a simplified equity-only approach to finance the construction stage, projects can reach financial close faster, are constructed at a lower cost, and reach a stage of power production sooner. Subject to development costs, there may be no need for Credit Enhancement. Below is a synopsis of financial analysis of the project.

- **Capital Expenditure (CAPEX):** Estimated at $8M–$10M, including land acquisition, equipment procurement, installation, and interconnection costs.

- **Operational Expenditure (OPEX):** Estimated at $100,000 per year, covering maintenance, insurance, and administrative costs.
- **Revenue Generation:**
    - Annual Energy Production: Approx. 18,250MWh (considering capacity factor of ~20%)
    - Annual Revenue: $1.28M (based on 7USc/kWh tariff)

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4 Energy Demand needs and forecast.

4.1 Current Energy needs

The surrounding local communities are predominately farmers and practice rudimentary methods of farming such as shifting cultivation (slash and burn) that has led to extensive cutting of trees in search of energy. There are a number of commercial agricultural farms within Mkinga district. In addition, the 838 JKT camp located at Maramba area has seen growth increasing intake numbers of trainees from 500 in 2013 to over 5000 in 2023. This increase has not only increased energy needs in the area but has also steered the growth of small semi-processing industries around the area with the availability of skilled and unskilled labour.

With the growth exhibited in the past 10 years, it is evident that the Mkinga feeder which feeds electricity to Maramba shall draw more power from Kange SS therefore the proposed Mkinga Solar Farm will bring sufficient, reliable, and affordable energy, reducing the technical losses and improving the voltage profile of the area.

4.2 Demand Forecasts

Establishment of fruit processing unit and Spice processing plants at Muheza district shall increase the energy demand along Mkinga Feeder which supplies Muheza District from Mkanyageni spur. The spice processing industry's production capacity is 1,228 tons per annum Cloves – 77, Cardamom – 756, Cinnamon – 106, Black pepper – 229, Ginger – 60, whereas the fruit processing industry has a current production of 80,000 tons per annum of citrus. Both these factories have added sophisticated machines to enhance production which in turn shall demand for more power.

5 Projects social – economic benefits

The following have been identified as the particularly relevant potential impacts during the construction, operation, and decommissioning phases of the proposed Mkinga Solar PV Project. A complete discussion of the Environmental and Social impact assessment shall be undertaken post confirmation of the site by TANESCO.

5.1 Positive Impacts

5.1.1 National economic growth

The Tanzanian government has set expanding electricity access to 250,000 people annually as one of its objectives. The proposed Mkinga SPP is a key infrastructure that will enable the Tanzanian Government to realise these objectives, while contributing to the country's enhanced security of energy supply by decentralising and diversifying Tanzania's energy mix. Additional benefits include the following:

- The proposed Mkinga solar project has the ability to boost Tanzania's economy through creation of financial capital i.e. revenues used within the economy, use of local financial facilities to make payments, use of local services and the collection of taxes, levies on transmission of bulk purchases of electricity, royalties and fees paid to the Government thus creating new and indirect revenue streams (for example, the collection of income tax from people employed to construct and undertake operation and maintenance of the proposed project), and other tax revenues from financial transactions associated with the acquisition of assets (such as land) for the proposed Mkinga solar project; and
- The proposed project will have multiplier effects on the local economy, including opportunities for locally supplied goods and services. These may range from construction materials associated with civil works e.g. locally available materials such as sand and cement, to the provision of maintenance and welfare services at accommodation facilities for project employees, as well as a range of other local value chain economic opportunities linked to the project's development, including business attributed to solar powered projects and other project equipment which will contribute a multiplier effect to spur other economic opportunities that may emerge.

5.1.2 Increasing the electricity supply to the national grid/reduction of carbon emissions:

The proposed Mkinga Solar Power project is expected to generate over 20 GWh of clean, affordable, and reliable energy annually which will be added to the Tanzania national grid.

5.1.3 Creation of employment opportunities:

The project is anticipated to create employment opportunities for both skilled and unskilled labour. Skilled personnel will be employed as Project Manager, Construction Engineers, Quality Assurance Manager, foremen, technicians among other technical positions, whereas unskilled labourers will be supporting staff and perform non-technical task.

5.1.4 Alternative source of energy:

The proposed project is anticipated to have an annual energy generation capacity of over 20 GWh. Therefore, the project will contribute to Tanzania's rural electrification program and reduce dependence on biomass energy which contributes to deforestation of 100,000 hectares of forest per year in Tanzania.

5.1.5 Improvement in infrastructure and services:

The availability of reliable energy generated from the plant shall ensure that facilities such as healthy centres, schools and communities received better services. The project shall also contribute to the development of the community through corporate social responsibility (CSR).

6 Project Development Activities

6.1 Financing for project development

Project development costs will be funded from the investment's funds offered by the project sponsors, and do not require additional financing.

6.2 Technical studies

The project shall sponsor and engage qualified consultants to undertake the detailed feasibility, Environmental and Social Impact Assessment studies, geotechnical investigation, and load flow assessment as part of the development once the site is awarded a letter of Intent by TANESCO. The study shall provide enough information on the nature of the soil and rock characteristics and further serve to attain an accurate budget estimate for all construction and operational activities.

Furthermore, to Environmental rules & regulations, the project shall submit the environmental and Social Impact Assessment report to National Environmental Management Council (NEMC) for application of EIA certificate.

6.3 Tendering

Among the assigned tasks of the consultants undertaking feasibility study is to prepare an estimate budget for the procurement of EPC contractor. Project Sponsors will float a tender after completion of technical studies for contractor selection and signing.

6.4 Project development Timelines and Milestones

Development Task	Expected Outcome	Timelines
Project Inception & Application for a letter of Intent	▪ Assessment of Load flow studies	Q4 2024
	▪ Demand growth Assessment	Q4 2024
	▪ Confirmation of project location	Q4 2024
	▪ Initial project land Assessment	Q4 2024
	▪ Economic Assessment	Q4 2024
	▪ Village/District letter of support	Q4 2024
	▪ Application for site confirmation to the offtaker	Q4 2024
	▪ Site confirmation with Offtaker and Issuance of Letter of Intent	Q2 2024

Application for Interconnection and Sale of Electricity	▪ Conduct feasibility Studies ▪ Project land acquisition ▪ Interconnection point detailed design. ▪ Topographical survey ▪ Geotech and geological survey ▪ Development of Business plan ▪ Conduct Environmental and Social Impact Assessment ▪ Application for an EIA Permit ▪ Application of Generation license	Q1 2025 Q2 2025 Q2 2025 Q1 2025 Q1 2025 Q1 2025 Q2 2025 Q3 2025 Q2 2025
Financing Closure and Construction	▪ Assessment of Load flow studies ▪ EPC Tendering and Contracting ▪ Initial debt finance arrangements ▪ EPC Design and Technical drawings ▪ Legal, Technical Due Diligence ▪ Financial Close and Construction	Q4 2025 Q4 2025 Q4 2025 Q4 2025 Q4 2025 Q1 2026

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