Project Summary

The Installation of a 3MW Solar Photovoltaic Power Plant at Cheddi Jagan International Airport

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1. ***A detailed description of the proposed project, including:***
   i. ***Physical location and its characteristics along with GPS coordinate/s; where applicable distances from the closest town, settlement, indigenous community, and nearby waterways such as creeks, rivers, closest town, etc; general/predominant land use (residential, tourism, agricultural, commercial, industrial, etc.) of the area; sensitive receptors (daycare facilities, schools, hospitals, etc.) likely to be affected by the proposed project; the relative abundance of natural resources in the area; and the non-disputed nature of the land.***

The Solar PV power project at CJIA aligned with GoG's commitment to implement the Low Carbon Development Strategy (LCDS) by promoting large-scale renewable energy projects. The solar PV project at CJIA will also significantly reduce the energy cost which will ultimately reduce the annual operating cost of the airport.

The CJIA airport is located on the right bank of the Demerara River, in the town of Timehri, 41 kilometres south of Guyana's capital, Georgetown. The project site is within the boundary of airport limits. From the airport's main entrance gate to the project site is 4 KM. The selected solar PV power project site is on the southeast face of the boundary, whereas airport functions are carried out opposite side (northwest face). The site is well connected by road. The reserved area for the solar PV power project is called Hyde Park location. The area identified to install the proposed 3 MWP solar PV plant is on the other side of the airport runway at Hyde Park. The total availability of land is 29 acres, of which 6 acres of the land can be used for installing a 3MWP solar PV plant. The additional 4 acres of the area can be used for future expansion of solar PV power plant for airport services and expansion facilities. Power generated from solar PV plant will be fed to GPL network (through nearest pole) at 13.8 kV using a step-up transformer (Approximate cable length: 600 meters). The panels will face south fixed at a tilt of 6.8° equivalent to the latitude of Georgetown. The GPS coordinates of the location are 6°50'36" N, 58°24'55" W with an elevation of 15m MSL. The details are provided in figure 1.0.

The site has a flat terrain with a gradient and is at an elevation of about 12 meters from mean sea level. At present the site has vegetation and trees, and small patches of land excavated to support old construction activity of the peripheral road of the airport. The proposed site is vacant state-owned land. Upon assessment no economic or social activities were found on or near the proposed site and no settlements were observed.

ii. ***A description of all feasible and reasonable alternatives.***

The identification of suitable locations for the solar PV project considered factors such as land availability, proximity to existing infrastructure, and the potential for solar resource. The land area requirement was estimated based on 6 acres per MWp of installed capacity, allowing adequate space for solar panels, inverters, transformers, roads, buffer zones, and other necessary infrastructure. The solar resource potential at the proposed site was estimated for Mono crystalline, string inverters of 250 kW rating and the step-up transformer is 2 X 2000 KVA.

Initially, two alternative sites were considered:

- Phase 1: Opposite the CJIA parking area.
- Phase 2: Near the Guyana Defence Force area.

These sites were chosen for a phased development of 1500 kWp in each phase, totalling 3MWp, aiming to meet the airport's annual energy demand. The proposed area for Phase 2 was approximately 11,190 square meters. The GPS coordinates of these locations were 6°30'20"N, 58°15'13" W with an elevation of 27m MSL.

Based on the identified areas, the available land was assessed for two-phased 1.5 MWp installations:

- Phase 1: 12,752 square meters (137,262 square feet)
- Phase 2: 11,190 square meters (120,448 square feet)

The panel orientation was to be south facing with a tilt angle of 6.8 degrees, matching Georgetown's latitude. Additionally, the land utilization depended on panel size and efficiency, which determined the potential power generation capacity:

- Area required for 1 kWp solar PV system: 70-80 square feet
- Solar PV system conversion efficiency: 18-21%
- Capacity of solar PV system for designated Phase 1 area: 1500 kWp
- Area required for 1500 kWp SPV system: 120,000 square feet
- Daily power generation of a 10 kWp system (average): 41.5 kWh
- Daily power generation from the 1500 kWp SRTPV system: 6,225 kWh

However, due to the close proximity of these sites to airport operations, particularly Phase 1, they were ultimately deemed unsuitable. The current proposed site at Hyde Park, with 10 acres allocated for the 3 MWp solar farm, was then selected as the preferred location.

iii. Description of any existing baseline information on the physical (landscape, soil, water, air, the use of natural resources), ecological (flora and fauna), and social environment (economic and cultural aspects).

Climate and Weather

Guyana has a wet tropical climate characterized by two pronounced wet seasons and year-round warm temperatures. The bimodal wet/dry regime is caused by the annual migration of the Inter -Tropical Convergence Zone (ITCZ), which changes latitude based on the Earth’s position and angle in relation to the sun. In the areas closest to the ITCZ, one can expect increased thunderstorm activity and heavy rainfall between mid-April and the end of July, with peak rainfall in June. This period is known in Guyana as the primary wet season. The secondary wet season occurs during the southward migration of the ITCZ from mid-November to the end of January, with peak rainfall in December.

Temperatures in Georgetown (including the Timehri area) are quite constant, with an average high of 32°C and an average low of 24°C in the hottest month (July), and an average range of 29°C to 23°C in February, the coolest month. The highest temperature ever recorded in the capital was 34°C and the lowest was only 20°C. Humidity averages 70 percent year-round. Near the Project, the hot season lasts approximately for 2.7 months, from August 12 to November 2, with an average daily high temperature above 31°C. The cool season lasts approximately for 2.9 months, from December 19 to March 16, with an average daily high temperature below 29°C (Figure 4.2). In Georgetown approximately 2,400 mm of rain fall per year. The wettest month is June, with 345 mm and the driest is September, with 90 mm.

The Project Site Timehri area of Georgetown is located, between the two relatively dry seasons, in September-October (when 90/95 mm or 3.5/3.7 inches of rain fall per month), it rains just a little less than in February-March, so the difference is not significant. Here, therefore, there is no real dry season. In Georgetown, 2,400 mm (94.5 in) of rain fall per year. The wettest month is June, with 345 mm (13.5 in) of rain. Here is the average precipitation. During the dry season, the strongest winds are experienced between January and April when the northeast Trade Winds dominate. Wind speeds range, on average, between 9 kilometres per hour (km/h) (wet season) and 12 km/h (dry season).

Geology and Topography

The Project site is located in the Demerara River Region (Called East Bank Demerara). The average thickness of Demerara and Coropina Clay Formations formations is approximately 45 m and they are commonly known as the uppermost clay, overlying the White Sand Series. The Coropina Formation or old coastal plain is a reddish-yellowish compact clay overlain by the recent grey-brown Demerara Clay, which extends seaward approximately 15 km. The area covered by the above clays is poorly drained and marshes and coastal lagoons are developed on it. The clays, which contain brackish water, confine the upper part of the White Sand complex.

The topography of the Project area is typically flat and is located above sea level (> 12 meters). The soils of the area are a combination of Demerara clays and white sand. The survey was performed from Gate 18 to 19 to capture the change in terrain. The survey found relatively consistent variations in terrain from the west and east sections. The elevation difference between Gate 19 to Gate 18 was approximately 3 meters. Finally, based on visual observations airport runway to the project site is approximately 10 meters lower than the airport runway (a bund kind of slop). The runway to the project site is 300 - 400 meters away, the project site is well-fenced. The southeast face of the project site boundary is adjacent to a public road.

Based on the construction activities at the airport in the vicinity of the project site, open-cast foundations would be adequate for building and regular pile foundations can be considered for module mounting structures (MMS) and others.

Infrastructure

The power evacuation point from the proposed solar PV Power plant is just outside the Gate 18 utility feeder (13.8 KV) line. The consent letter for power utility (GPL) was obtained and the upgradation of the feeder has been proposed.

Local water utility lines (GWI) can be tapped, and rainwater collection can be suitably installed (as local practices) to meet water demand. For the construction work nearby storm water can be drawn, with required permits from airport authorities.

iv. Layout of the project, presented on a map with a scale relevant to the size of the development with the following details:

- ***a) an accurate indication of the proposed site position, as well as, the positions of alternative site/s, if any;***
- ***b) closest town/s, if any;***
- ***c) names of major and minor access road/s to the site;***
- ***d) identification of receiving waterbodies;***
- ***e) identification of any existing or proposed intake and discharge structures; and***
- ***f) identification of effluent/emission discharge points.***
- ***g) The map shall also include a north arrow and a legend.***

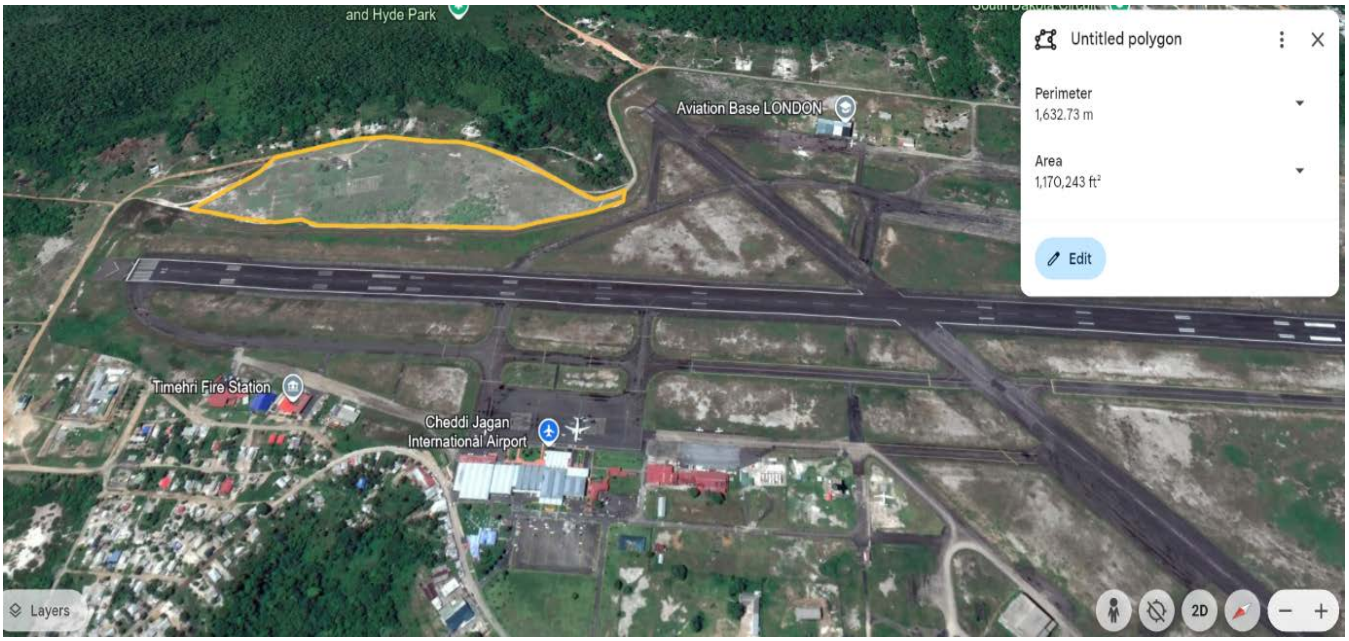

Figure 1.0: Area of the location Hyde Park (6°50’36” N, 58°24’55” W)

The reserved area for the solar PV power project is called Hyde Park location. The site has a flat terrain with a gradient and is at an elevation of about 12 meters from mean sea level. At present site has vegetation and trees, and small patches of land excavated to support old construction activity of the peripheral road of the airport. The vegetation in the project site is to be removed and levelled as site preparation is needed. Using available gradient proper storm water drainage can be designed.

The total availability of land is 29 acres, of which 10 acres (it is envisaged 6 acres can be completed and utilised for mounting of solar PV panels based on ongoing ground-mounted PV projects and balance 4 acres for civil structures and other BOS systems) is allocated for installing a 3MW_P solar PV plant.

The utilisation of the identified area depends on the size of the panel and its efficiency defines the potential power generation capacity.

Area required for 1 kWp solar PV system	70 - 80 sq. ft.
Solar PV system conversion efficiency	18 -21%
Capacity of solar PV system	3000 kWP
Area required for 3000 kWP SPV system	240,000 sq. ft
Daily power generation of 10 kWP system (average)	45 kWh
Daily power generation from 3000 kWP SRTPV system (PVsyst-Solcast simulation results)	13,494 kWh

2. A description of the design of the proposed which shall include:

i. Design\construction drawings, specification of any structures, volume of expected pollutants, etc.

The construction drawings are currently being developed. Upon acceptance and approval, they will be submitted to the agency.

ii. The project size, e.g. capital investment, number of employees projected for each stage of the project, rates of production, transportation route etc;

The total cost of project is estimated at USD 3.31 mn, which shall be funded by Government of India Line of Credit (GOILOC) of USD 2.50 mn, while the balance amount of USD 0.81 mn and any additional amount as per bid shall be brought upfront by GO-GUY. The Indian content proposed for the project is envisaged at 85.40%, and accordingly, the tendering for EPC contractor will be done with minimum Indian content requirement of 85%.

As per the Guidelines of GOI, the Indian Content for solar projects shall be met by procuring the solar modules from the list of Approved List of Module Manufacturers (ALMM) approved by Ministry of New and Renewable Energy (MNRE), GOI. Further, all critical components including inverter shall be procured from Class I Indian manufacturers, which shall form part of tender conditions.

Comprehensive maintenance contract (CMC) will be inbuilt under the scope of the EPC contractor for the first 2 years and shall be stipulated accordingly under tender conditions. The cost of the Comprehensive Maintenance contract (CMC) after the period of 2 years shall be borne by GO-GUY or CJIA management shall engage internally trained staff for maintenance.

The number of employees projected for each stage is yet to be determined.

iii. Activities associated with all development stages from construction to closure:

a) operation and production processes and alternative design/ considered;

The total availability of land is 29 acres, of which 6 acres of the land can be used for installing a 3MWP solar PV plant. The additional 4 acres of the area will be used for future expansion of solar PV power plant for airport services and expansion facilities. When established this solar farm will farm will produce 3MWp. This power generated will be fed to GPL network (through nearest pole) at 13.8 kV using a step-up transformer (Approximate cable length: 600 meters).

b) a guide for all stages of the project from raw material to the finished product; and

This will be provided when the information is available.

c) ***technical description of the proposed project's process/activity accompanied by a Process Flow Diagram/s;***

This will be provided when the information is available.

iv. ***Use of Natural Resources: approximate quantities of raw materials required at each stage of the project and their possible sources;***

The only foreseeable natural resources that will be utilized are white sand and loam to fill the project site and to create the accesses. Qualities are yet to be determined.

v. ***Source of utility services such as water supply and treatment options, energy/electricity and communication facilities;***

The source for water supply will be from GWI, while the source of electricity will be from GPL.

vi. ***Waste production: types of waste, the monthly quantity/volume of waste managed (generated, stored, transported), the volume of effluent to be discharged along with a chemical analysis indicating the effluent's composition and methods of waste disposal/treatment. Potential locations for recovery/disposal sites shall be identified with justifications for the site selection;***

Waste accumulated during the construction of this project will be disposed of at a designated solid waste site identified by the Timehri NDC and the Region 4 Town Council. Waste will also be backfilled where relevant; quantity of waste cannot be determined at this time.

vii. ***The duration of the project for each phase; and***

To be determined

viii. ***Decommissioning plan (where applicable).***

Not Applicable

3. Potential Impacts and their Significance

An assessment of the potential impacts of the proposed development and its significance in relation to:

i. ***the extent of the impact or the area of influence: the geographical area that may be affected by the proposed activity and the manner in which the various aspects of the environment: physical (landscape, soil, water, air, the use of natural resources), ecological (flora and fauna), and social (economic and cultural aspects) may be impacted;***

Air Quality		
Construction Phase	**Operation**	**Decommissioning**
Dust generation: expected to be brief, frequent, and localized due to preparation of the site and use of heavy machinery (clearing, levelling, excavation, grading). Dust generation from road proximity to the site may generated dust from heavy duty traffic based, on physical inspection, the road that lead to the sites and where households are located are completed paved in all three sites. Effects can be minimized with adequate mitigation measures. The impact is considered minor. Nitrogen and Carbon oxides emission: expected to be brief and localized due to the operation of heavy machinery, transportation trucks, generators, compressors and other construction equipment. The impact is considered minor.	No carbon emission (+): since substation only distributes power. The impact is considered insignificant	Dust generation: expected to be brief, frequent, and localized due to preparation of the site and use of heavy machinery (clearing, levelling, excavation, grading). Effects can be minimized with adequate mitigation measures. The impact is considered minor. Nitrogen and Carbon oxides emission: expected to be brief and localized due to the operation of heavy machinery, transportation trucks, generators, compressors and other construction equipment. The impact is considered minor.
Noise		
Elevated noise levels: Due to the nature of the land designated to the PV Plant, the surroundings are cane fields and a public drain for irrigation purposes, concluding that the site have low noise levels as expected	Low noise levels: localized low levels of noise due to operation of electrical components of the PV plant, maintenance activities, and vehicular traffic. The impact is considered minor.	Elevated noise levels: Brief, frequent and localized elevated noise level due to dismantling of facilities, increased vehicular traffic, and movement of equipment. The impact is considered minor.

Soil		
Loss of top soil: Long-term and localized loss of top soil during site clearing and preparation activities. The impact is considered minor. Soil compaction: Long-term and localized soil compaction which may cause soil erosion and surface water runoff and riverbed silting. Effects can be minimized with adequate mitigation measures. The impact is considered minor. Soil contamination: Brief and localized soil contamination due to oil spills or other substances. Effects can be avoided with adequate mitigation measures. The impact is considered minor.	No impacts expected.	Soil contamination: Brief and localized soil contamination due to oil spills during dismantling activities. Effects can be avoided with adequate mitigation measures. The impact is considered minor.

Land Use		
Land use: The proposed site comprises 26 acres of State-owned land. Therefore, there are no foreseen conflicts with regards the Land use. The impact is considered minor. There is access road to the PV; therefore, there are no conflicts with the Land use of the land. The proposed transmission line will be interconnected with/by GPL, thus it does not interfere with any current economic activities; no conflicts are expected.	Land use: The site will be used for energy generation for the lifetime of the facility. There is no significant change in the land use of the site. The installation of the PV systems will not significantly impact the economic activities of the area. The impact is considered minor.	Land use: The site will be dismantled, and the facilities removed. The future site use shall be in line with the land use of the area or be restored to its initial stage. The impact is considered minor
Landscape and Visual Impacts		
Visual landscape: The installation of the PV system will alter the visual landscape of the project site. The components of the PV system will become a dominant feature of the environment. The effects can be minimized with adequate mitigation measures. The impact is considered major.	Visual impact: The PV systems will reflect sunlight and may become a distraction for motorists and aircrafts. The effects can be minimized with adequate mitigation measures. The impact is considered major.	Visual landscape: The decommissioning of the system will reverse the visual impacts at the proposed site. The impact is considered minor.

Solid Waste		
Construction waste and domestic waste generation is expected to be temporary and localized but significant in volume. As an indirect impact, it is highly probable that temporal food supply business will increase nearby the project site. These businesses will also be a source of increased generation of solid waste that will need to be considered in the project. Poor solid waste management on site may lead to improper disposal, burning, and pollution of water resources. The effects can be minimized with adequate mitigation measures. The impact is considered moderate.	Solid waste generation Increased: Domestic waste generation may be expected during maintenance activities on site. Although the generation will be long-term and localized, the volume generated can be considered low. The effects can be minimized with adequate mitigation measures. The impact is considered minor.	Solid waste generation Increased: Solid waste generated is expected to increase in the decommissioning stage. Solid waste generated is expected to be localized, temporary and significant volume of domestic, scrap metal, construction waste, and hazardous waste. The effects can be minimized with adequate mitigation measures. The impact is considered moderate.
Surface Water		
Surface water pollution: Construction activities may result in pollution of nearby surface water due to runoff (increased turbidity, organic load). This is expected to be temporary and controlled with adequate drainage and wastewater management at the site. Potential spills of oil could cause contamination of the nearby surface water through run-off. This aspect is temporary and easily avoidable. Wastewater generation from construction crew living quarters may also cause increased organic load to nearby water bodies if not adequately managed.	Surface water pollution: During operation, wastewater will be generated from security/maintenance staff offices and cleaning of the PV cells. The effect is expected to be long term and can be mitigated with adequate collection and management practices. The removal of soil cover might generate minor impacts due to erosions during operation also.	Surface water pollution: Activities may result in pollution of public irrigation canal due to runoff (increased turbidity, organic load). This is expected to be temporary and controlled with adequate drainage at the site. Potential spills of oil could cause contamination of the nearby public irrigation canals. This aspect is very localized, temporary and easily avoidable. The impact is considered moderate.

The impact is considered moderate.	Potential spills of oil could cause contamination of the nearby public irrigation canals. This aspect is very localized, temporary and easily avoidable. The impact is considered minor.	
Ground Water		
Contamination of groundwater resources: Groundwater resources may be impacted during the construction stage from oil spills and leaks or due to improper storage and handling. Improper solid waste and wastewater management can also impact the groundwater resources. The effects are considered temporary and medium spread. Adequate measures can minimize potential effects. The impact is considered moderate.	Contamination of groundwater resources: Groundwater resources may be impacted by improper solid waste and wastewater management can also impact the groundwater resources. The effects are considered long term, and medium spread. Adequate measures can minimize potential effects. The impact is considered moderate.	Contamination of groundwater resources: Groundwater resources may be impacted during the decommissioning stage from oil spills and leaks or due to improper storage and handling. Improper solid waste and wastewater management can also impact the groundwater resources. The effects are considered long term, and medium spread. Adequate measures can minimize potential effects. The impact is considered moderate.
Natural Habitat		
Loss of natural habitat: The project site is considered highly disturbed with regards to its vegetation, since the land allocated for the PV plant is land unattended.	Visual effects: Solar panels reflection may affect birds as the main wildlife in the surroundings, and transmission lines	Noise levels: Noise generated by decommissioning activities is more likely to impact any wildlife in the surrounding area

There are also low levels of biodiversity with regards to fauna. There is no indication of presence of threatened or protected flora or fauna species at the proposed site for construction. The impact is localized, long term, with low intensity due to the disturbed conditions of the site. Hence, the impact is considered minor. Noise levels: Noise generated by construction workers and machinery is more likely to impact any wildlife in the surrounding area of the site. The effects are limited to the project site and immediate surroundings. Due to the low fauna biodiversity of the area the impact is considered minor.	may affect bird mortality. The effects will be long term and localized. PV plants can impact bird communities through habitat loss and the risk of avian collision mortality. Future data are needed in order to have a better accuracy in bird density and to understand the risk of PV solar energy developments on birds. The impact can be considered moderate.	of the site. The effects are limited to the project site and immediate surroundings. Due to the low fauna biodiversity of the area the impact is considered minor.
Demography		
Demography: During the construction phase an increase of population is expected in the area. While residents are expected to take part in some construction activities, there may also be the need for an influx of workers with specific skills. The effects are considered temporary and localized. In general, this will bring a positive socio-economic impact to the area. However, demographics are not expected to be significantly impacted during this stage. The impact can be considered as minor.	Demography: Operation of the PV systems doesn't require a large group of staff. Additionally, maintenance and operational activities are expected to be carried out by GPL staff. The effects will be long term, localized but insignificant with regards population increase due to system operation	Demography: Decommissioning activities will need to ensure the quality of the GPL service is not affected negatively. In such case, the removal of the system is more likely to have an impact in the socio- economic activities of the area and its demography.

	The impact is considered minor. Socio-economic activities: An expected indirect impact of the operation of the PV systems is the increase of population in the area. The increase of energy production with the current reliable service from GPL, will naturally promote an expansion of socio- economic activities in the area thus impacting also the demography. This effect is considered high spread, long term and significant for the community. The impact is considered major.	For the purpose of this assessment, it is assumed that GPL service after decommissioning will be maintained, therefore, decommissioning of the system is not considered to have a significant impact.
Employment		
Employment: During the construction phase employment opportunities will be generated for local skilled and unskilled labour. There will also be a demand for local goods and services which will have an impact on the earning capacity of local businesses. These impacts while positive are expected to be only temporary and localized. The impact is considered minor.	Employment: The operation of the PV systems will be managed by GPL staff. Therefore, a direct impact on employment generation is not expected during this phase. Socio-economic activities: An expected indirect impact of the operation of the PV systems is the increase of employment in the area.	Employment: Similarly, than the construction phase, there may be employment opportunities during the dismantling of the plant. However, this is expected to be in a much lesser extent than in the construction phase. The impact is considered minor.

	The expected improvement on the reliability of this service, will naturally promote an expansion of socio- economic activities in the area thus impacting employment opportunities. This effect is considered high spread, long term and significant for the community. The impact is considered major.	
Displacement		
Displacement: The proposed site is State-owned land. There are no human settlements or economic activities currently at the proposed site. Therefore, the project will not cause any type of displacement. The process for the GPL to obtain the Land Title has begun through a request to the NICIL. There are no foreseen issues for GPL to obtain the land title.	No impacts expected on the operation phase.	No impacts expected in decommissioning phase.

Livelihood		
Livelihood: There are no known economic activities currently developed near the site. Therefore, the construction of the PV system is not expected to affect means of livelihood for persons in the area.	Livelihood: The operation of the PV system will increase energy security and access in the area and will support the development of a greener economy. It is highly likely that because of the project economic activities will expand and diversify bringing new employment opportunities and improving also the quality of life in the community. The effects will be spread at the community level and will be long term. There is also an anticipated positive effect on income generation opportunities for women. The impact is considered major.	Livelihood: For the purpose of this assessment, it is assumed that GPL service after decommissioning will be maintained, therefore, decommissioning of the system is not considered to have a significant impact.
Socio- Cultural		
Socio-cultural: While there may be a temporary increase of construction workers in the area, the local customs, cultures, and social relations are not expected to be significantly impacted. There are no cultural sites on the project site.	Socio-cultural: The operation of the PV systems is expected to be performed by local GPL staff. There are no expected impacts on local customs, culture, and social relations directly related to the operation of the PV systems.	Socio-cultural: There are no expected impacts on local customs, culture, and social relations directly related to the decommissioning of the PV systems.

Infrastructure		
Upgrading of the access road to the proposed site may not create traffic disturbances. The use of the current trail should be considered and relevant stakeholders contacted to ensure no significant disruption of activities to users. The impact is considered moderate.	Infrastructure: During the operation of the PV system, the energy service is expected to be reliable. Modular PV systems are resilient to disruptive events. Even if a module is damaged, the system would remain operational. This will benefit the customers and will minimize power outage in the area. Water supply service is expected to be impacted positively, since power disruptions to the distribution system will also be minimized. Effects will be long term and spread at the community level. The impact is considered major.	Infrastructure: For the purpose of this assessment, it is assumed that GPL service after decommissioning will be maintained, therefore, decommissioning of the system is not considered to have a significant impact.
Public Health and Safety		
Health and Safety: During the construction phase there will be health and safety hazards on site and in areas surrounding the site due to increase vehicular traffic, heavy machinery operation, excavation, and other construction activities. The effects will be localized and temporary.	Health and Safety: workers will be exposed to occupational hazards. The probability of occurrence can be minimized by strict adherence to occupational safety procedures. The impact is considered minor.	Health and safety: Similarly, than in the construction phase, exposures to hazards are expected from the decommissioning activities. Health and safety procedures shall be observed to minimize the effects. The impact is considered moderate.

However, the effects can be minimized by strict adherence of the Contractor to approved safety procedures. Influx of construction workers may lead to increase in the prevalence of sexually transmitted diseases among the local population, as well as sexual violence. Considering that local labour is expected to play a major role, this concern can be regarded as low. However, health and awareness campaigns as well as a code of conduct indicating clear repercussions can minimize any effect. The impact is considered moderate.		

ii. the trans frontier nature of the impacts i.e. does it cross country borders or boundaries;

Response: Not applicable

iii. the magnitude and complexity of the impacts;

Response: Not applicable

iv. the probability of the impacts

Response: Not applicable

v. the duration, frequency and reversibility of the impacts; and

Response: Not applicable

vi. Cumulative impacts with other projects: additional surveys and assessment may be required to determine whether existing projects in combination with the proposed project will have a significant cumulative effect on the receiving environment.

Response: Not applicable

4. Description of proposed environmental management and mitigation measures for all environmental, ecological and social impacts .

	Issue/ Impact	Mitigation Measures	Monitoring Indicators	Responsibility for Implementation	Responsibility for Monitoring	Estimated Cost for Each Site (US$) *(To Be Determined)*
Air Quality	Dust generation	• Covering of stockpiles to minimize dust generation. • Suppress dust from construction, stockpiles and increased vehicular traffic by sprinkling water. • Consider wind direction when stockpiling construction materials. Orientation shall avoid downwind sensitive locations.	• PM monitoring. • Dust generation observation. • Complaints register.	All contractors on site.	Site Supervisor.	
	NOx and COx emissions	• Regular maintenance of vehicles and on-site construction equipment	• Equipment maintenance records according to schedule. • Vehicle fitness certificates.	All contractors on site.	Site Supervisor.	
	Noise	• Use of padding/noise isolators for construction equipment and machinery.	• Monitoring of dB. • Complaints register.	All contractors on site.	Site Supervisor.	

		• Fixed noise sources or activities to be carried out away from site boundaries, particularly boundaries close to sensitive environments. • Adequate maintenance of construction vehicles and machinery. • Use of ear plugs or ear muffs for specific activities by workers. • Stakeholders' consultation (immediate surroundings of site) to plan activities accordingly.	• Equipment maintenance records according to schedule. • Workers compliance to H&S procedures. • Consultation records.			
Soil	Top soil loss	• Limit the removal of forest to the site footprint. • Whenever possible, removed top soil should be conserved and used for remediation of affected areas.	• ESMP Compliance records.	All contractors on site.	Site Supervisor.	
	Soil compaction and erosion	• Adequate drainage will be developed for the site. • Planting grass or use of rocks under the solar panels is also	• ESMP Compliance records.	All contractors on site.	Site Supervisor.	

Land Use (ROW)		• Current land use of the ROW is road reserves commonly used for installation of infrastructure networks such as the one for the proposed project. The new transmission lines for interconnection of PV Farm to the grid and substations will be done within the existing right oof way. Therefore, there is no expected modification of the Land use of the proposed transmission lines. The impact is considered insignificant. New transmission/Interconnection line is about 200 meters in length for Retrieve PV site and 423 meters in length for Block 37.	• Complaints register. • ESMP Compliance records.	All contractors on site.	Site Supervisor.	
	Landscape and visual impact	• It is recommended to landscape the boundaries with adequate trees to provide a visual screen. • Consultation meetings with aeronautical authorities with regards	• ESMP Compliance records. • Consultation meeting records.	All contractors on site.	Site Supervisor.	

		positioning and direction of solar panels to avoid conflicts with airplanes.				
	Solid waste generation	• Waste will be disposed in an authorized landfill. • Adequate planning and coordination will be done with the landfill management to manage the increased volume expected to be generated from the site. • The site will be provided with an adequate number of bins for the disposal of domestic waste. • Hazardous waste management plan will be developed by contractor. Hazardous waste such as spent oil, oily rags, etc. will be stored on site and disposed of according to an approved plan and in line with EPA recommendations.	• ESMP Compliance records. • Consultation records with solid waste management authorities. • Compliance with Hazardous waste management plan. • Complaints records. • Valid contract with solid waste collection contractor. • Existence of at least one container bin outside the project site where food services providers are located. (if necessary).	All contractors on site.	Site Supervisor.	

		• Burning of waste on-site will be prohibited. ▪ Adequate arrangements will be done for the frequent collection of domestic, construction and hazardous waste. • The project will facilitate bins outside the site to food supply entrepreneurs and will arrange for the collection of such waste. • Site and immediate surroundings cleanliness will be maintained at all times.				
	Surface water pollution	• Adequate drainage will be designed for the site to minimize run-off. • Drainage system will be monitored and frequently maintained. • Adequate temporary sanitary facilities will be provided for	• ESMP compliance records. • Existence of temporary sanitary facilities. • Valid contract with waste collection contractor.	All contractors on site.	Site Supervisor	

		• Frequent collection of waste generated by sanitary facilities will be done by an EPA approved contractor.				
	Groundwater pollution	• Oil spills, fuel spill and other site contaminants will be rapidly cleaned. • Adequate temporary sanitary facilities will be provided for workers on-site while permanent facilities are constructed. • Frequent collection of waste generated by sanitary facilities will be done by an EPA approved contractor	• ESMP compliance records. • Existence of temporary sanitary facilities. • Valid contract with waste collection contractor.	All contractors on site.	Site Supervisor.	
	Loss of natural habitat	• Pre-vegetation weed control • Fencing • Dieback mapping & Site Hygiene • Ripping Fauna Rescue Plan • Record fauna find • Allow fauna to leave without intervention • Cease work if species are threatened.	• Note the effectiveness of the mitigation measures or the need for improvement of such. • Protect soil during climate change	• Overseeing – GEA • Environmental Health & Safety Officer	• Overseeing- GEA Environmental Health & Safety Officer	

		• Relocate fauna find • Call experienced fauna ecologist to carryout fauna handling especially if seriously injured	• Erosion from heavy rainfall) • Restore site to its previous state • Injuries to fauna • Loss of endangered species			
	Demography and Employment	• Employment of local labour should be maximized. • Transparent recruitment process will take place.	• Employment records. • Number of local labour employed at the site.	All contractors on site.	Site Supervisor.	
	Socio- cultural	• Regular community consultation meetings will take place.	• Monthly community consultation records.	All contractors on site	Site Supervisor.	
	Infrastructure	• Timely and adequate public announcements with regards any service interruption due to the project.	• Duration of service interruption. • Service interruption records	All contractors on site.	Site Supervisor.	

	Health and Safety and Security	• Health and Safety plan will be implemented by contractor on site. • Workers awareness sessions on health and safety issues will be carried our regularly. • awareness campaigns to the population and training to workers to mitigate community health and safety impacts • Training on security forces on proportional use of force and employment of unarmed security • All persons on site will use personal protective equipment (PPE). • Site emergency response plans will be developed. Including Fire Safety Plan. • Adequate fire-fighting equipment will be provided on site.	• H&S Plan compliance records. • H&S awareness sessions attendance records. • Site emergency response and Fire Safety plans • Developed and implemented. • ESMP compliance records. • Visible traffic and speed signage.	All contractors on site.	Site Supervisor.	

		• Adequate signage on site and in surrounding areas should be visible and properly maintained. • Traffic control and speed limits will be observed. • Working hours will be limited to day-light, unless otherwise agreed with relevant stakeholders. • Occupational hazards should be marked on site and staff trained on hazard recognition. • Cleanliness of the site will be maintained at all times.				
	Health: HIV/AIDS	• Use code of ethics, conduct, and good practices from GEA standards and guidelines. Especially Training, awareness, and education on the use of infection control measures in the workplace during the period of construction phase; Equip	• Compliance with the code of ethics • Behaviors which facilitate unintentional injuries and violence, ▪Tobacco use, ▪Alcohol and	Health and safety officer. Program should be adapted to comply with local laws.	Health and safety officer	

		to protect colleagues from the risk of exposure to HIV; Disseminate information on HIV/AIDS including occupational health and first aid training.	drug use, ▪ Sexual behaviours related to pregnancy and sexually transmitted diseases, ▪ Unhealthy dietary behaviours, and ▪ Physical inactivity and being overweight.			

5. ***A summary of minutes of any public consultations/ meetings held by the Project proponent with key stakeholders expressing their views and opinions.***

Meetings were held with CJIA and GPL to obtain permission for the installation of Solar PV panels and the injection of the full energy output into the GPL grid. Both stakeholders agreed to the installation of the solar farm, and acceptance letters/responses were submitted to the agency as supporting documentation.

6. ***A description of any assumptions, uncertainties and gaps in knowledge.***

Not Applicable.

7. ***A non-technical summary of the project (a summary of what the project is about in layman's language that clearly describes your project).***

Guyana's current and historical CO2 emissions have stemmed primarily from the burning of fossil fuels, mainly diesel, for electricity generation. To reduce this dependence and diversify its energy supply, the Government of Guyana (GoG) is actively working to diversify Guyana's energy mix through the share of renewable energy. Recognizing the potential of solar power, GoG identified Cheddi Jagan International Airport (CJIA) as a suitable location for a ground-mounted solar PV plant.

This project aligns with GoG's commitment to the Low Carbon Development Strategy (LCDS 2030) by promoting large-scale renewable energy projects and contributing to a sustainable energy future for Guyana. The solar PV project at CJIA will significantly reduce energy costs, leading to lower annual operating expenses for the airport.

To support this initiative, the Government of Guyana, through the Guyana Energy Agency and The Energy Research Institute (TERI), will advance a 3-megawatt-peak (MWp) solar PV farm project at CJIA. This project, with a total cost of USD 3.31 million, will be funded by GOILOC with USD 2.50 million, while GO-GUY will contribute the remaining USD 0.81 million and any additional costs as per the bid. The project is expected to be completed by 2027.

Upon completion, the 3 MWp Solar PV farm is expected to:

- Reduce generation costs and simultaneously increase generating capacity for the Guyana Power and Light (GPL) grid through a renewable energy source.
- Avoid CO2 emissions by displacing fossil fuel-based electricity generation.
- Enhance the reliability of service at CJIA.
- Empower Guyanese by fostering greater participation in the renewable energy industry within Guyana.