

Global Luzon Energy Development Corporation 2X335MW Coal-Fired Power Plant Project EIS Summary for the Public in English

November 2017



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EIS SUMMARY FOR THE PUBLIC

1.0 PROJECT FACT SHEET

| Name of Project | : | 2x335 MW Coal-Fired Power Plant Project | |
|--|---|---|--|
| Project Location | : | : Brgys. Nalvo Sur and Carisquis, Luna, La Union | |
| Project Area | : | Approximately 41 hectares | |
| Project Type/ Nature | : | Thermal power plant | |
| Combustion Technology | : | Supercritical pulverized coal | |
| Source of Main Fuel | : | Indonesia and other countries | |
| Type of Fuel | : | Bituminous or sub-bituminous coal | |
| Scale of Production | : | 2x300MW (net), 2x335MW (gross) | |
| Construction Period | : | 3.5 years | |
| Commercial Operation Date | : | First Quarter of 2022 | |
| Operation Duration | : | 25 years | |
| Name of Proponent | : | Global Luzon Energy Development Corporation (GLEDC) | |
| Address | : | 22nd Floor GT Tower International, 6813 Ayala Avenue, Makati City | |
| Contact Details | : | +63 (32) 464-1600 | |
| Authorized Representative for ECC Application | • | Jaime T. Azurin (President - GBP) Emil Garcia (VP - Vivant) | |
| | | | |

Global Luzon Energy Development Corporation (GLEDC) is the special purpose company formed for execution of the project. It consists of companies with experience in the development and operations of power plants located across the Philippine Islands.

2.0 PROJECT DESCRIPTION

2.1 Project Location, Area and Accessibility

The proposed coal-fired power plant project will be situated in Barangays Nalvo Sur and Carisquis, Luna, La Union. The project land area is currently classified as a special industrial zone (based on the Comprehensive Land Use Plan (CLUP) 2014-2023). The project location showing the region and barangays is presented in **Figure 1** and **Figure 2** shows the project facilities/ components in a NAMRIA topographic map.

The project site is a 41-hectare property through which the national highway traverses. Both sides of the national road consist of mahogany plantations. The project will lease a foreshore area of 2.3529m². The property is bounded by a barangay road in the south, Barangay Pila in the east, Nalvo Sur in the north, and the West Philippine Sea in the west. Within the project site is a ground depression lying east to west.

The project site is about 300km north-west of Metro Manila and can be reached over 4 to 6 hours via the North Luzon Express way (NLEX), then through the Subic-Clark-Tarlac Expressway (SCTEX) and the Tarlac-Pangasinan-La Union Expressway (TPLEX) exiting at the town of Binalonan, Pangasinan. Travelling via MacArthur Highway thereafter will lead straight to the province of La Union.





Figure 1. Project Location Map

LEGEND: No legend

ENVIRONMENTAL SUMMARY FOR THE PUBLIC 2x335MW COAL-FIRED POWER PLANT PROJECT

SCALE: 1:45,000 DATA INFORMATION/SOURCE: Basemap: GOOGLE EARTH IMAGERY, 2017 Project Boundary: GLEDC, 2017 Boundaries: LUNA CLUP, 2014-2023 Imagery Date: DECEMBER 1, 2016 Created by: APERCU CONSULTANTS, INC (2017)

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Basemap and Boundary: NAMRIA Topographic Bangar Sheet 3034-I Project Boundary: GLEDC 2017 Created by: APERCU CONSULTANTS, INC (2017)





2.2 Project Type and Process

The proposed 2x335 MW Coal-Fired Power Plant Project will make use of the Supercritical Pulverized Coal (SPC) Technology. The power plant will be designed for burning bituminous and imported coal from Indonesia and other foreign sources. The imported coal will be delivered via the jetty and then transferred through a covered conveyor system to an enclosed coal yard for storage. From the coal yard, coal will be conveyed to the crusher house for crushing, to the coal silos, and then pulverized before being fed to the boilers. The coal will be combusted to heat the water in the boiler tubes and produce steam which will then be passed into a turbine to produce electricity. The electricity generated will be transmitted to the Luzon Grid through a 500kV double circuit overhead transmission line to be connected to the Bolo substation, 160km from the project site.

The proposed power plant will have two (2) boiler units, each with its own steam turbine, generator and electrostatic precipitator (ESP). Flue gas from the ESP will pass through a seawater desulphurizer that is designed to remove SO_2 before emissions are released to the atmosphere via the stack. The combustion process in the boilers will produce fly ash, which will be sold to cement manufacturers, and bottom ash, which will be disposed of in an ash disposal area lined with clay and HDPE.

Water for the cooling requirements will be drawn from the West Philippine Sea and will be returned as a heated effluent.

2.3 Project Components and Capacity

| Project Components | Capacity |
|------------------------------------|---|
| Jetty | Approximately 150 m to 300m |
| Boiler system, Steam Turbine, | Gross 2 x 335MW |
| Generator and Auxiliaries | Net 2 x 300MW |
| Coal handling and coal feed system | Enclosed Coal Yard: 150,000-ton capacity for 29 day worth |
| | 2 covered coal stock piles at 10m high |
| | Bottom Ash Silo: 2 units, 72-hr capacity |
| Ash handling system | Coarse and fine ash silos : 2 for each unit, for 72-hr capacity, 1200m ³ |
| | Lined ash disposal area: approximately 1.5 hectares for five- |
| | year storage capacity of bottom ash |
| Cooling Water System (intoke and | Intake pipe: 1 x ~ 341.390m |
| | Sea water intake tower : 2 |
| | Discharge pipe (outfall): 1 x ~ 417.902m |
| | Electrostatic precipitators : 1 set for each boiler; ≥99.7% |
| | efficiency |
| Pollution control systems | Seawater Flue Gas Desulfurization (SWFGD): 2 units |
| | (including 2 absorber and 2 Seawater Treatment Systems) |
| | Wastewater Treatment facilities : 106,179 tph |
| | Plant water system : 111,792 tph |
| Process systems | Condensate system: 106,124 tph |
| | Closed cycle cooling water system :111,624 tph |

Table 1 List of Project Components





| Project Components | Capacity |
|------------------------------------|---|
| | Desalination and demineralization system: 156 tph, 39 tph |
| | Electro-chlorination system : 257 tph |
| Stack | 180 m high, One common stack to serve both units |
| Fuel Oil evetom | Fuel oil transfer pump: 35m ³ /hr; 150m |
| Fuel OII System | Fuel oil tank : 400m ³ , 1 storage tank |
| | Instrumentation and control |
| Support systems | Firefighting system |
| | Continuous Emission Monitoring System |
| Electrical and transmission system | Double circuit 500kV transmission line to be connected to the |
| | Bolo substation 160 km from project site, subject to SIS |

2.4 Resource Utilization and Project Alternatives

The proposed power plant will utilize the following resources:

- Coal to be used as the primary fuel in electricity generation, approximately 5,112 tons per day for the 2 units. This will be imported from Indonesia and other foreign sources.
- Water requirements which will be drawn out from the West Philippines Sea, broken down as follows:
 - Cooling water requirements 111,624 tons/hr
 - Freshwater requirements 78 tons/hr for service water, demineralized water and potable water.
 Water service providers will be tapped to augment this requirement.
- Manpower of 2,500 to 3,000 skilled and unskilled workers during construction and around 300 workers for the power plant's operations.

2.5 Site Alternatives

Three sites were considered for the proposed power plant.

| | Table 3 | | | |
|---|---|--|--|--|
| Site Alternatives of the Proposed Power Plant | | | | |
| Site | Considerations | | | |
| Site 1 Luna, La Union | Presence of pebble collecting activities on the beach front Presence of a municipal landmark is situated at the beach – head Presence of agricultural farms on the property Site is owned by several landowners Target depth of 16-18m for the jetty is reached at 500m from the shoreline Land use classification: agricultural | | | |
| Site 2 Rosario, La Union | Presence of few residential houses Property composed of farmlands and fish ponds Target depth of 16-18m for the jetty is reached at 1km from the shoreline Land use classification: agricultural | | | |





| Site 3 (Project Site) | Rolling hills terrain No residential houses will be affected by the project Target depth of 16-18m for the jetty is reached at 150-350m from the shoreline |
|-----------------------|--|
| | Project land area is classified as a special industrial zone; beach front is classified as agricultural but can be utilized as industrial as stated in the CLUP (2014-2023) |

As shown in the above table, the site located in Brgys. Nalvo Sur and Carisquis in Luna, La Union was eventually selected and preferred over the two alternative sites. The characteristics and condition of the selected site are summarized as follows:

- No presence of residential dwellers in the site; thus, the project proponent will not have to deal with resettlement issues.
- The properties comprising the proposed site have been idle for years compared to the agricultural farms and fish ponds that are found on the two other sites.
- The site is highly accessible with the national road traversing it while a barangay road bounds on the southern part.
- The nature of the proposed project in the site is consistent with Luna's designation of the area as a special industrial zone per Comprehensive Land Use Plan for 2014-2023.
- Support from the host communities as evidenced by the project endorsement issued by the barangay, municipal and provincial councils.
- No indigenous people were noted in the site and surrounding areas based on the field-based investigation conducted by NCIP personnel in October 2017. Hence, GLEDC expects a certificate of non-overlap will be issued eliminating issues concerning ancestral domain.
- Since the site is located on a coastal area, the sea offers a possible source for cooling water requirements as well as a possible location of the jetty that will be used in the transport and delivery of coal.
- The site is also found to be outside identified areas with liquefaction potential; not prone to landslides and other mass movement hazards; not exposed to extreme climatologic conditions; and has low susceptibility to flooding.

2.6 Fuel Source Alternatives

As a developing country, the Philippines' energy usage is increasing because of growth in our industries and the growing demand from households. Daily activities in large and small businesses, hospitals, schools, offices, government agencies and households are heavily dependent on electricity. However, the power supply from existing power plants is not enough to meet the continually increasing demand. According to the Department of Energy's Power Development Plan for 2016-2040, the country's additional capacity requirement is projected at 5,357MW in 2022 and will increase to 43,765MW by 2040. Baseload power comprises 807MW of the total capacity requirement in 2022. And by 2040, baseload power will comprise around 58% or 25,265MW of the capacity requirements.

In view of this demand, a baseload power plant is proposed on the selected site. Coal emerged as the preferred option after due consideration to the characteristics and conditions of the selected site. Although not considered baseload, the renewable energy potential of the selected site is likewise assessed.

The assessment of the different types of fuel and energy sources that have been considered in the development of this power plant project is summarized in **Table 4**.





| Table 4 | | | |
|--|--|--|--|
| Fuel Source Alternatives of the Proposed Project | | | |

| Fuel/Energy Source | Considerations | Assessment | |
|--------------------|---|------------|--|
| Coal | Among fossil fuels, coal is considered the most abundant therefore significant reserves are available. According to <i>BP Statistical</i> <i>Review of World Energy in 2016</i> , the reserve-to-production ratio or the estimated time the reserve for coal will last considering the current of production is 114 years, compared to 52.8 years for natural gas and 50.7 years for oil. Thus, because of its availability and affordability, coal comprises majority of the electric power generation mix in the world. The selected site is also well-suited for a coal-fired power project because of its flat terrain, its ease of accessibility and its close proximity to the sea. | ✓ | |
| Natural Gas | No sufficient liquefied natural gas (LNG) supplies are found in proximity to the selected site. | Х | |
| Geothermal | Geothermal power plants are site-specific and, so far, there are no geothermal fields that have been found on the selected site or on its nearby areas. | х | |
| Solar | Based on the Solar Resource Map of the US-based National Renewable Energy Laboratory (NREL), La Union is not among the best sites for solar compared to the provinces of Ilocos, Tarlac, and Pampanga, among others, wherein utility-scale solar power plants are developed. | Х | |
| Wind | NREL's Philippine Wind Energy Resource Atlas classifies the wind resource potential of the site as marginal with wind speed ranging only from 4.4 to 5.6 m/s. On the other hand, wind turbines used in wind utility-scale power plants will require a wind speed of at least 10 to 15 m/s to operate. | | |
| Hydroelectric | The nearest river – Darigayos River is 2 km away from the selected site. After considering the five existing water permittees of the river, the equivalent generating capacity is minimal. | | |

2.7 Technology Selection

Two types of technology are available for high power generating coal-fired power plants. These are the Pulverized Coal (PC) technology and the Circulating Fluidized Bed (CFB) technology. A comparison of these technologies is presented in **Table 5**.

The proposed project will use the **Supercritical Pulverized Coal (SPC) Technology** because it is an efficient technology. SPC uses higher temperatures and pressures to achieve better efficiency, reduced fuel consumption and less greenhouse gas emissions on a per kWh of electricity output. Thus, the project's technology will not only address the country's demand for cheap electricity but will meet stringent environmental standards as well.





Table 5 Technology Selection

| Technology | Description |
|------------|---|
| PC | PC boilers are widely used in large commercial units ranging from 300 MW to above 1000MW. It usually uses either sub-critical, supercritical or ultra-supercritical pressure. The supercritical technology is selected for this project because it yields higher thermal efficiency than the sub-critical type while the ultra-supercritical technology is being relatively less deployed, hence the environment impact would be lessened in comparison to less efficient sub-critical unit of same output. The Supercritical Pulverized Coal (SPC) technology uses super critical pressure and higher main steam temperature which mostly ranges from 540 to 566°C. The NOx formation in the furnace of a PC boiler is controlled using low-Nox burners or a combination of combustion optimization systems (low Nox burners, Flue Gas Recirculation, and Over-fire air) depending on the target furnace concentration. Sulfur dioxide is efficiently removed using a standalone Seawater Flue Gas Desulfurization System. |
| CFB | Circulating Fluidized Bed (CFB) technology offers excellent multi-fuel capabilities and is a good option for burning low grade coal, or combinations of diversified fuel. The use of relatively lower furnace temperature compared to the PC technology results to lower Nox emissions. Sulfur dioxide is removed through addition of limestone in the furnace, which converts the SO ₂ to sulphates during the combustion and circulation that goes out with the ash. Commercial Unit capacities with CFB technology, however, are limited to 200~300 MW range, when 600MW commercial CFB boiler has been operated under very limited occasion for mostly demonstration purpose. |

3.0 PROJECT PROPONENT

Global Luzon Energy Development Corporation is the special purpose company formed for execution of the project. The principal proponents are Vivant Integrated Generation Corporation (VIGC) and Global Business Power Corporation (GBP).

Vivant Integrated Generation Corporation (VIGC) is a Cebu-based local holding company. It is 100% owned by Vivant Energy Corporation whose ultimate parent is the publicly-listed Vivant Corporation. VIGC houses all of Vivant Group's investments in coal-fired power projects all over the country. Vivant Energy Corporation, along with its partners, also operates 1590, a 210MW diesel power plant located in Bauang, La Union.

Global Business Power Corporation (GBP) is a leading energy company in the Visayas Region and Mindoro Island. GBP produces adequate, reliable and cost- efficient power supply through five (5) subsidiaries that operate then (10) power generation facilities. GBP has established its position as one of the notable power industry players in the country as it enjoys strong ties with the prime movers in the energy sector.

4.0 PROJECT IMPLEMENTATION SCHEDULE

The overall project construction schedule is estimated to be thirty-six (36) months for unit 1 and forty-two months (42) for unit 2. The proposed construction schedule is projected to commence not later than August 2018 and the plant is expected to operate for 25 years.





5.0 PROJECT IMPACT AREA AND ANALYSIS OF KEY ENVIRONMENTAL IMPACTS

The project impact areas are delineated into direct and indirect impact areas. The Direct Impact Area (DIA) for this proposed GLEDC power plant includes the 41-hectare property within Barangays Carisquis and Nalvo Sur. Additionally, the results of the air dispersion modeling predict that at normal conditions, the potential highest Ground Level Concentrations of NOx, the particular pollutant of concern, may occur 7km southeast of the stack. Thus, the mountainous area where GLCs may occur was likewise designated as a DIA.

Specifically, the DIA include:

- Land 41 hectares of land covered by the project footprint
- > Water
 - o Areas of the West Philippine Sea fronting the project site where marine resources are present
 - Leased foreshore area 23,529m²
 - Area designated as the temperature compliance monitoring point of the thermal effluents (672m²)
- Air area 7km southeast from the stack, where the highest GLCs for the 24hr NO₂ exceedances are predicted to occur
- > People residents within barangays Carisquis and Nalvo Sur.

The Indirect Impact Area (IIA) is the area outside of the DIA. The IIA, as per MC 2010-14, is clearly delineated only after the EIA study is done and is more accurately established during post-ECC monitoring. The municipality of Luna and the barangays not included in the DIA are considered indirect impact areas.

The summary of impacts identified below were compiled as a result of the EIA. The proposed mitigation measures are also included in the table below. The identified impacts and corresponding mitigation measures are presented in **Table 6** below.





Table 6 Environmental Management Plan for the 2x335MW Coal-Fired Power Plant Project

| Environmental Component Likely to be Affected | Potential Impact | Options for Prevention or Mitigation or Enhancement |
|--|---|--|
| CONSTRUCTION PHASE | | |
| | Change/Inconsistency in Land Use | Project site is compatible with the existing comprehensive land use and zoning plan of Luna – the area is categorized as a special industrial zone. A vegetated area will be created around the proposed coal fired power plant to separate the neighboring residential and tourism establishments. |
| | Project is in an area which constitutes the habitat of endangered or threatened species | Secure a tree cutting permit Collect seedling of indigenous species and establish a nursery with these Establish a vegetated area using these indigenous species |
| | Project site is an area frequently visited or had- hit by natural calamities – prone to storm surges and tsunamis | Build the plant at an elevation at least equal to elevation of the national road |
| | Devaluation of land value as a result of improper solid waste management and other related impacts | Comply with the Ecological Solid Waste Management Act of 2000 implemented by the LGU, such as: Solid wastes diversion through re-use, recycle, and composting activities; Solid wastes segregation from point of waste source to "compostable", "non-recyclable", "recyclable" |
| A. The Land | Change in surface landform/topography/terrain/slope | Install appropriate slope protection. Remove loose rocks to prevent occurrence of rock fall Provide appropriate drainage design for roads that will be constructed to avoid road failure Provide appropriate drainage in the area of intermittent creek |
| | Inducement of subsidence or collapse | Conduct further geotechnical studies prior to construction to determine presence or absence of solution cavities and use the results as inputs to the detailed engineering designs to minimize the threat of subsidence Comply with the recommended foundation design based on the result of the detailed geotechnical studies |
| | Soil erosion/loss of topsoil/ overburden and bank stability | Limit excavation and land clearing to what is required for project construction. Stabilize stockpiles and provide enclosures for excavated soils to minimize occurrence of erosion and minimize sediment transport particularly during the rainy season. Prioritize major earthworks during the dry season Provide siltation ponds or silt traps around work areas Re-vegetate exposed areas |
| | Change in soil quality/fertility | Designate an equipment and vehicle maintenance area that is cemented and provided with proper drainage channels Inspect vehicles and machinery regularly. Use oil sumps in engine rooms and vehicle equipment maintenance areas. |





| Environmental Component Likely to be Affected | Potential Impact | Options for Prevention or Mitigation or Enhancement |
|--|---|--|
| | | Collect and store oil sludge in oil sludge tanks that are lined with impermeable materials. Dispose hazardous wastes through a DENR accredited hazardous waste transporter and treater Establish an ash pond that is lined with clay and HDPE |
| | Vegetation removal and loss of habitat | Establish a vegetated area around the project site. Collect seeds and wildlings of indigenous species such as narra, mahogany, bani, bolong eta, danglin, isis, and molave, prior to construction and use these to establish a nursery Limit vegetation clearing and movement of workers only to designated work areas |
| | Threat to existence and/or loss of important local species | Limit development activities within the proposed project area Delineate areas to be cleared to avoid unnecessary clearing Establish a nursery using important local species |
| | Threat to abundance, frequency and distribution of important species | Limit vegetation clearing only to designated work areas Establish a nursery using important local species on the buffer zone and identified tree-planting sites |
| | Disturbance or loss of species due to habitat loss | Limit vegetation clearing and movement of workers only to designated work areas Ensure compliance with all regulations relevant to minimizing noise generated from construction of the power plant |
| | Change in drainage morphology/inducement of flooding/reduction in stream volumetric flow | Design an efficient drainage system with silt traps and with a storm water outfall that discharges to the sea Re-align and/or reroute any affected portion of the intermittent creek or replace the natural drainage system by providing a system of open canals to ensure that rainwater flow to the main storm water outflow will not be impeded Provide channel ditches and/or pipe drains to carry the generated flows, around work areas, to the main storm water outfall, especially before backfilling the existing drainage and depression in the project area |
| | Change in stream, lake water depth | The project is not expected to cause a change in stream depth. The intermittent creek within the project site will be re-aligned prior to construction of plant facilities. |
| B. The Water | Depletion of water resources/ competition in water use | Freshwater demands of the power plant during both construction and operation phases will be supplied by a water service provider There are no NWRB water grantees within the project boundary. All water grantees are located upstream of the project site. If groundwater will be tapped, conduct groundwater study and apply for necessary NWRB permit prior to use of groundwater |
| | Occurrence or aggravation of flooding in nearby areas | Re-align and/or improve the channel of the creek draining the project site |
| | Change/disruption in water circulation pattern, littoral current, coastal erosion and deposition | Design the jetty, the intake and outfall pipes to minimize disruption of circulation patterns Ensure that construction activities will be confined only within necessary areas |





| Environmental Component Likely to be Affected | Potential Impact | Options for Prevention or Mitigation or Enhancement |
|--|---|---|
| | | Establish levees and wave deflectors on the shore during the construction of the coastal structures |
| | Change in water circulation pattern | Design the jetty, the intake and outfall pipes to minimize disruption of circulation patterns |
| | Change in bathymetry | Design and orient the jetty, and the intake and outfall pipes to minimize disruption of circulation patterns and prevent sediment build-up in the jetty area |
| | Degradation of groundwater quality | Schedule the construction activities during the dry season (as much as possible) Maintain construction equipment, machinery and trucks in good condition (e.g. free of oil leaks) Repair impaired machinery and vehicles in a designated and cemented maintenance area with equipped with proper drainage and oil absorbing materials Orient and train workers and contractors to effectively implement safe environmental management practices within the construction sites Provide on-site toilets and facilities at work areas Establish and implement ecological solid waste management plans |
| | Degradation of surface water quality | Create and implement a sedimentation and erosion control plan. Set up devices to retain sediments and materials and prevent these from being carried away by run-off Provide on-site toilets and facilities at work areas Establish and implement ecological solid waste management plans Re-vegetate construction sites to prevent erosion. |
| | Degradation of coastal/marine water quality | Create and implement a sedimentation and erosion control plan. Set up devices to retain sediments and materials that may find its way to the sea Dispose excess soil in order to prevent storm water from carrying the particles into the coastal waters Orient and train workers and contractors to effectively implement safe environmental management practices within the construction sites Provide on-site toilets and facilities at work areas |
| | Threat to existence, abundance, distribution and/or loss of important local species and habitat | Use the EIA coral map to identify pathways of least disturbance to benthic life form communities in determining the most suitable location for the coastal structures Install silt curtains and adopt entrapment mechanisms to prevent sediments and silt from blanketing coral reef areas Protect and induce expansion of seagrass colonies Implement mangrove reforestation, where feasible Adopt engineering designs that will ensure that pipe lying will have the least disturbance to coral colonies Conduct coral transplantation, where feasible Avoid building of permanent structures in sensitive areas where bivalves are assessed to reproduce |
| C. The Air | Change in local micro-climate | Establish a greening program in cooperation with PENRO |





| Environmental Component Likely to be Affected | Potential Impact | Options for Prevention or Mitigation or Enhancement |
|--|---|--|
| | Contribution in terms of greenhouse gas emissions | Regular maintenance of heavy equipment and motor vehicles to avoid amplified greenhouse gas emissions Install pollution control devices |
| | Degradation of air quality | Implement dust suppression measures such as water application and speed restrictions (15-20 kph), in active construction areas Vegetate non-structure areas to minimize wind erosion of topsoil Compact exposed soil surfaces Provide tarpaulin cover on trucks loaded with construction materials Haul spoils/excavated earth materials immediately after excavation Regular maintenance of heavy equipment and motor vehicles Install pollution control devices Construct stack with appropriate height to ensure effective emission dispersion |
| | Increase in ambient noise level | Regular maintenance of mufflers of standby generators and other noise generating equipment Provision of ear plugs to workers directly exposed to high noise equipment Use of effective noise-attenuating materials for the plant's structure and walling Planting of the appropriate vegetation around the plant |
| | Displacement/ disturbance of properties | There are no residents within the project site that will be displaced |
| | Change/conflict in landownership | The proposed site is private property that has been acquired by the project proponent. The property is covered by a transfer certificate of title. |
| | Change/conflict in Right of Way | The proposed project site has already been acquired by the proponent and is covered by a transfer certificate of land title. No conflict in right-of-way is expected. |
| | In-migration | Provide the barangay with a complete list of the project's workers, contractors and employees. |
| D. The People | Proliferation of Informal Settlers | Assist and coordinate with the LGU to set-up a migration information center in barangay halls for easier migrant tracking Report visitors staying in the area for more than a month |
| | Threat to delivery of basic services/resource competition | Assist the LGU in the proper planning of community resources Assist the LGU in the proper implementation of the CLUP Assist the LGU in the preparation of Barangay Development Plans and Barangay Disaster Risk Reduction Management Plan for barangays Carisquis and Nalvo Sur |
| | Threat to public health and safety | For power plant employees: Provide safety and environmental awareness trainings for workers Orient and train workers on occupational health and safety Provide Personal Protective Equipment (PPE) Implement safety protocols Provide ample potable water within the construction site |





| Environmental Component Likely to be Affected | Potential Impact | Options for Prevention or Mitigation or Enhancement |
|--|---|--|
| | | Provide first aid facilities at the community centers/halls and designate a safety officer to monitor safe working conditions For threats to public health due to pollutants: Install pollution control devices to meet emission limits Undertake excessively noisy activities during the day Provide proper sanitation and sewage at work sites; enforce sanitation discipline among workers Re-vegetate disturbed soil as soon as possible Implement solid waste and hazardous materials management systems |
| | Generation of local benefits from the project | Payment of taxes and fees on time Assist LGU in tapping revenues generated under ER 1-94 (e.g. assist in the preparation of required documents, assist in liaising with DOE) Assist in the development of a more active Barangay Development Council (BDC) to coordinate and enhance local benefits |
| | Enhancement of employment and livelihood opportunities | Provide skills training to residents of the community prior to the hiring process to increase the likelihood of barangay residents being hired Assist LGU in identifying and planning development projects Implement CSR projects in coordination with the LGU |
| | Increased business opportunities and associated economic activities Increased revenue of LGUs | Assist LGU in identifying and planning development projects Implement CSR projects in coordination with the LGU |
| | Traffic Congestion | Install appropriate traffic and safety signs, especially on the national highway segment encompassed by the project |
| OPERATION PHASE | | |
| A. Land | Inducement of subsidence or collapse Change in soil quality/fertility | Subsidence, caused by excessive groundwater withdrawal, is not expected from the project Establish a designated and cemented area for equipment and vehicle parking and maintenance Establish a cemented fuel storage area Inspect and maintain equipment and machinery to avoid oil spills and leaks Use oil sumps in engine rooms and vehicle equipment maintenance areas Collect and store oil sludge in oil sludge tanks Dispose hazardous waste through a DENR accredited hazardous waste transporter and treater |
| B. Water | Degradation of groundwater quality | Provide cemented areas and proper drainage channels for rainwater runoff for Vehicle repair and maintenance area Fuel oil storage area Coal storage area Les discharge pipe design that promotes repid and officient mixing |
| | Degradation of coastal/marine water quality | Use discharge pipe design that promotes rapid and emicient mixing |





| Environmental Component Likely to be Affected | Potential Impact | Options for Prevention or Mitigation or Enhancement |
|--|--|---|
| - | | Use wastewater treatment plant to ensure water quality of any effluents will not exceed DENR effluent standards |
| | Threat to existence and/or loss of important local species and habitat | Keep alterations in the land-sea interface to a minimum Ensure that construction activities will be confined only within necessary areas Avoid building permanent structures and remove temporary structures immediately in sensitive areas where bivalves are assessed to reproduce |
| | Threat to abundance, frequency, and distribution of species | Continuously support strategies to improve fish production and recruitment such as campaign against use of fine mesh nets and other destructive fishing methods; provide alternative livelihood programs Establish a Coastal Resource Management Program focusing on the immediate coastal vicinity of the project site, in coordination with the LGU and relevant government agencies |
| | Change in local microclimate | Establish and implement a greening program in cooperation with PENRO |
| C. Air | Air pollution from stack emissions | Ensure operation and maintenance of PC boilers are according to specifications; Ensure proper operation and maintenance of ESP, SWFGD, and NOx and CO reduction systems |
| | Air pollution from standby generators and vehicle emissions | Ensure proper operation and maintenance of generator set engines Formulate and implement a motor vehicle maintenance program, including emissions testing |
| | Carbon dioxide emissions | Establish and implement a greening program in cooperation with PENRO |
| D. People | Threat to public health and safety | For power plant employees: Provide safety and environmental awareness trainings for workers Orient workers on occupational health and safety Provide Personal Protective Equipment (PPE) Implement safety protocols Provide first aid facilities at the community centers/halls and designate a Safety Officer to monitor safe working conditions Put up appropriate safety signages around the plant For threats to public health due to pollutants: Ensure proper operation and maintenance of pollution control devices and water treatment facilities to meet emission and effluent limits, respectively Promote proper sanitation and sewage storage at work sites; enforce sanitation discipline among workers |
| | Threat to delivery of basic services/resource competition | Assist in the Implementation of the updated Comprehensive Land Use Plan of the Municipality of Luna Assist LGU in the preparation of Barangay Development Plans and Barangay Disaster Risk Reduction and Management Plans for Brgys Nalvo Sur and Carisquis |
| | Lifestyle change | Conduct continuous IECs to include talks on lifestyle changes as a result of increased income |
| | Generation of local benefits from the project | Provide employment opportunities for local residents |



| Environmental Component Likely to be Affected | Potential Impact | Options for Prevention or Mitigation or Enhancement |
|--|--|---|
| | | Pay taxes to concerned LGUs on time |
| | | Assist LGU in identifying and planning development projects |
| | | Implement CSR projects in coordination with the LGU |
| ABANDONMENT PHASE | | |
| A. Land | Displacement of habitat for flora and fauna | Perform Assisted Natural Regeneration (ANR) using threatened species identified during the EIA right after dismantling all the structures |
| B. Water | Disposal of wastes and abandoned structures | Supervise proper waste disposal and implement proper solid waste management Ensure appropriateness of the selected land fill site for wastes, including ash Re-vegetate the project site |
| | Abandonment of jetty and other offshore structures | Remove structures and monitor recovery of the coastline from any previous accretion and/or scouring |
| D. People | Impact on employment and livelihood | Conduct community development planning prior to abandonment so that residents, whose source of income and livelihood is the power plant, will be prepared for the eventual abandonment/decommissioning of the project |





6.0 IDENTIFIED STAKEHOLDERS

As discussed in **Section 5.0**, the project impact area includes barangays Carisquis and Nalvo Sur where the 41-hectare property of the project will be located. It also includes area defined to be within the boundaries of the air dispersion, thermal plume and particle transport modelling that also include the area occupied by the jetty, effluent outfall and seawater intake structures. Additionally, an exclusive zone with dimension: 350m left of jetty, 500m seaward and 200m right of discharge (based on thermal plume modeling) was also considered as part of the impact area.

The Indirect Impact Area (IIA) is the area outside of the DIA. The IIA, as per MC 2010-14, is clearly delineated only after the EIA study is done and is more accurately established during post-ECC monitoring. The municipality of Luna and the barangays not included in the DIA are considered indirect impact areas.

Based on the above discussion and as per requirement of DAO 2017-15, the stakeholders identified to be invited to the public hearing is presented as **Table 7**.

| Stakeholders | Address | | |
|---|--------------------------------|--|--|
| Concerned Regional and Provincial Government Agencies/ Offices and Government Unit | | | |
| Representative | House of Representative | | |
| Governor | City of San Fernando, La Union | | |
| Vice Governor | City of San Fernando, La Union | | |
| Provincial Planning and Development Office | City of San Fernando, La Union | | |
| Department of Environment and Natural Resources Regional Office (Region I) | City of San Fernando, La Union | | |
| Department of Environment and Natural Resources-Environmental Management Bureau Regional Office (Region I) | City of San Fernando, La Union | | |
| Mines and Geosciences Bureau - Regional Office I | City of San Fernando, La Union | | |
| Department of Public Works and Highways - Region I | City of San Fernando, La Union | | |
| Bureau of Fisheries and Aquatic Resources (Region I) | City of San Fernando, La Union | | |
| DENR - PENRO (La Union) | City of San Fernando, La Union | | |
| DILG Regional Office (Region I) | City of San Fernando, La Union | | |
| Department of Labor and Employment Regional Office I | City of San Fernando, La Union | | |
| Department of Tourism - Region I | City of San Fernando, La Union | | |
| Concerned Offices in Luna Municipality | | | |
| Mayor | Municipality of Luna, La Union | | |
| Vice Mayor | Municipality of Luna, La Union | | |
| Department Head, Municipality ENRO | Municipality of Luna, La Union | | |
| Disaster Risk Reduction Management Office | Municipality of Luna, La Union | | |
| Municipal Planning and Development Office | Municipality of Luna, La Union | | |
| Municipal Engineering Office | Municipality of Luna, La Union | | |
| Municipal Health Office | Municipality of Luna, La Union | | |
| Luna Fisheries and Aquatic Resources Management Council | Municipality of Luna, La Union | | |
| Barangay Carisquis LGU | Municipality of Luna, La Union | | |
| Barangay Nalvo Sur LGU | Municipality of Luna, La Union | | |
| Barangay Pila LGU | Municipality of Luna, La Union | | |
| Barangay Nalvo Norte LGU | Municipality of Luna, La Union | | |
| Barangay Darigayos LGU | Municipality of Luna, La Union | | |

 Table 7

 Identified Stakeholders for the Public Hearing





| Stakeholders | Address | | | |
|---|--------------------------------|--|--|--|
| Other Barangay LGU of Luna / Association of Barangay Chairman (ABC) | Municipality of Luna, La Union | | | |
| Concerned Communities and Peoples Organization | | | | |
| Residents from Barangays Nalvo Sur and Carisquis | Municipality of Luna, La Union | | | |
| Residents from Barangays Darigayos, Nalvo Norte and Pila | Municipality of Luna, La Union | | | |
| Residents from Other Barangays in Luna | Municipality of Luna, La Union | | | |
| Fisherfolks Association of Luna | Municipality of Luna, La Union | | | |
| Farmer's Association of Luna | Municipality of Luna, La Union | | | |
| Academe Sector | Municipality of Luna, La Union | | | |
| Religious Sector | Municipality of Luna, La Union | | | |





7.0 PROPONENT'S STATEMENT OF COMMITMENT AND CAPABILITY

This is to certify that the proponent Global Luzon Energy Development Corporation (GLEDC) is capable and committed to implement the necessary mitigating measures to minimize the adverse effects and enhance the beneficial impact by the proposed 2 x335MW Coal-Fired Power Plant Project located in Barangays Carisquis and Nalvo Sur, Municipality of Luna, Province of La Union.

| In witness hereof, we hereby set | my hands this | 14th day of | November 2017 at | Cobu City. |
|----------------------------------|---------------|-------------|------------------|------------|
| Philippines | | | | |

Emil Andre M. Garcia

Vice President Global Power Energy Development Corporation

| SUBSRIBED AND SWORN | TO before me this b. <u>PP No - P22281944</u> | _ day of NOV 1 4 2017 _ issued at DFA_ себи on 3/9/2 | ing their 017 |
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| aperçu consultants inc | LE 65101 NOTARY PUBLIC * | UNTIL DECEMBER 31, 2018 UNITS 1501-1502 AYALA LIFE-FGU CENTER CEBU BUSINESS PARK, CEBU CITY ROLL NO, 65101 PTR NO, 1174596 - CEBU CITY - 01/06/17 IBP LIFETIME NO. 015200 | 19 |



8.0 INFORMATION ON WHERE TO GET A COPY OF THE EIS FOR FURTHER INFORMATION

The draft Environmental Impact Statement (EIS) and this ESP will be posted in the EMB website (<u>www.emb.gov.ph</u>) at least 20 days before the public hearing. Upon completion of the review, a copy of the final EIS will be available to the public from the following government unit and agencies:

| Agency | Address |
|-----------------------------------|--|
| DENR – EMB | DENR Compound, Visayas Avenue, Diliman, 1100 Quezon City, Philippines |
| Department of Energy | Department of Energy, 2F PNOC Building V, Energy Center, Rizal Drive, 34th St, Taguig, 1632 Metro Manila |
| Provincial Government of La Union | La Union Capitol Building, Aguila Road, San Fernando, La Union |
| Municipal Government of Luna | Luna Municipal Hall, McArthur Highway, Barangay Salcedo Luna, La Union |
| Barangay Office of Carisquis | Carisquis Barangay Hall, Purok 6, Luna, La Union |
| Barangay Office of Nalvo Sur | Nalvo Sur Barangay Hall, Purok 4, Luna, La Union |

A copy will also be available from the office of GLEDC at 22nd Floor GT Tower International, 6813 Ayala Avenue, Makati City.

