

PROJECT DESCRIPTION FOR SCOPING

Proposed 1,700 MW Batangas Combined Cycle Gas Turbine Power Plant Project

Barangays Dela Paz Proper and Ilijan, Batangas City

Submitted to:



ENVIRONMENTAL MANAGEMENT BUREAU
Department of Environment and Natural Resources
DENR Compound, Visayas Avenue, Quezon City, Metro Manila

Submitted by:



PANASIA ENERGY, INC.

3204-B, East Tower, PSE Centre, Exchange Road,
Ortigas Center, Pasig City

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PROJECT DESCRIPTION FOR SCOPING

Proposed 1,700 MW Batangas Combined Cycle Gas Turbine Power Plant Project
Panasia Energy, Inc. Barangays Dela Paz Proper and Ilijan, Batangas City

1.0 BASIC PROJECT INFORMATION

1.1 Project Information

Project Name	1,700 MW Batangas Combined Cycle Gas Turbine Power Plant Project
Project Location	Barangays Dela Paz Proper and Ilijan, Batangas City
Project Type	Thermal Power Plant (LNG-Fired)
Project Area	60 hectares
Project Capacity	1,700 MW
Project Technology	Combined Cycle Gas Turbine (LNG-Fired)

1.2 Profile of the Proponent

Name of Proponent	Panasia Energy, Inc.
Proponent's Address	3204-B, East Tower, PSE Centre, Exchange Road, Ortigas Center, Pasig City 1605
Authorized Signatory/ Representative/s	Noemi T. Moreno , AVP-COO and CFO Michael C. Lopez, Jr. , Marketing Manager Antonio O. Mercado , Tariff and Regulatory Affairs Manager
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Brief Description of the Proponent

Panasia Energy, Inc. (**PEI**) is a corporation duly organized under and by virtue of Philippine laws. PEI was registered in the Securities and Exchange Commission on 22 October 2007. As stated in the Articles of Incorporation, the general business of the corporation is power generation. PEI is a wholly-owned subsidiary of Millennium Energy, Inc. (**MEI**).

2.0 PROJECT DESCRIPTION

2.1 Project Location and Area

The proposed 1,700 MW Batangas Combined Cycle Gas Turbine Power Plant Project of PEI is to be located in Barangays Dela Paz Proper and Ilijan, Batangas City. The proposed Project will be located in area consisting of 60 hectares which will be leased by PEI. The location map of the proposed Project is shown in **Annex 1**.

The direct impact areas (**DIA**) cover the areas where the proposed Project will be sited. In terms of socio economic benefits, the DIA areas include the host local government units (**LGUs**): Barangays Dela Paz Proper and Ilijan, Batangas City and Region IV-A, otherwise known as the CALABARZON Region. These are the project beneficiaries for employment, business opportunities, taxes and benefits from Department of Energy (**DOE**) Energy Regulations (**ER**) 1-94 of the Electric Power Industry Reform Act (**EPIRA**) Law as well as reliable power supply that contributes to the economic stability of the Region.

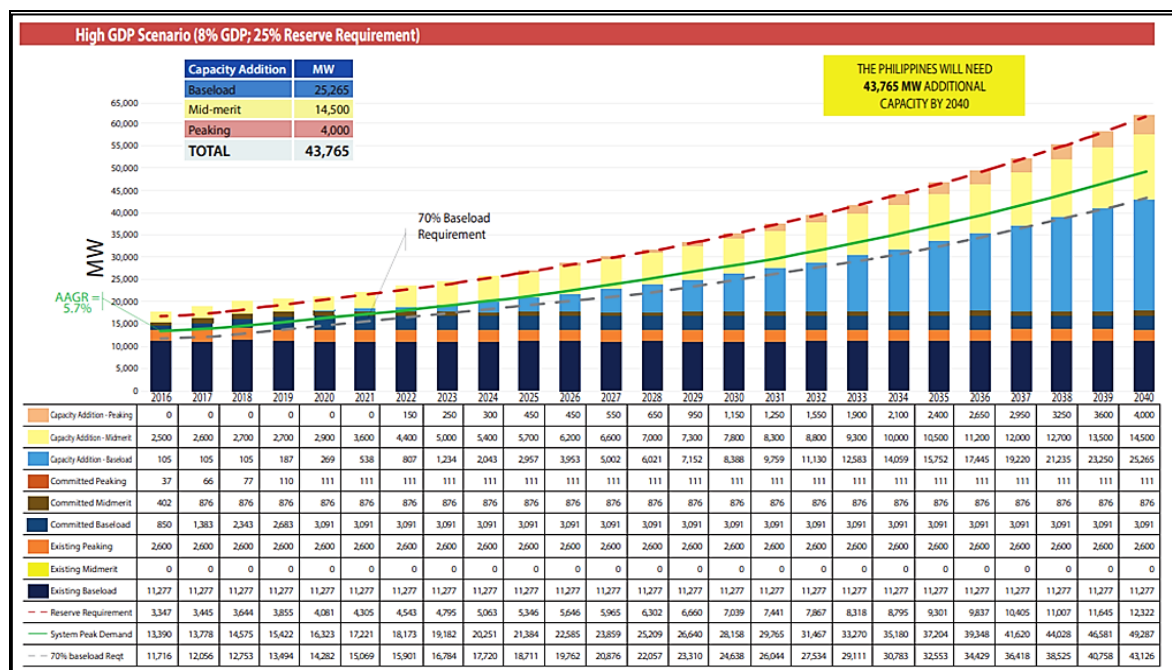
The indirect impact areas (**IIA**) include the effluent discharges and plant's air emissions that comply with the standard limits of the DENR. The IIA in terms of socio economic benefits, will cover the entire country, which will benefit from the stable and reliable power supply which can contribute further to the economic stability of the country. The direct and indirect impact areas are shown in **Annex 2**.

2.2 Project Rationale

2.2.1 Project Need at the National Level

Strong economic growth and a rise in energy demand have exerted pressure on the Philippines' energy sector in recent years. 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. The Philippines demand-supply outlook for 2016-2040 is presented in **Figure 1**.

Given the country's rapidly growing economy, demand for power will outpace supply in the Philippines in the next years. The proposed Project will help augment the demand for reliable and affordable baseload power supply. The proposed Project will not only supply enough electricity to Filipino households and businesses but will also contribute to national development.

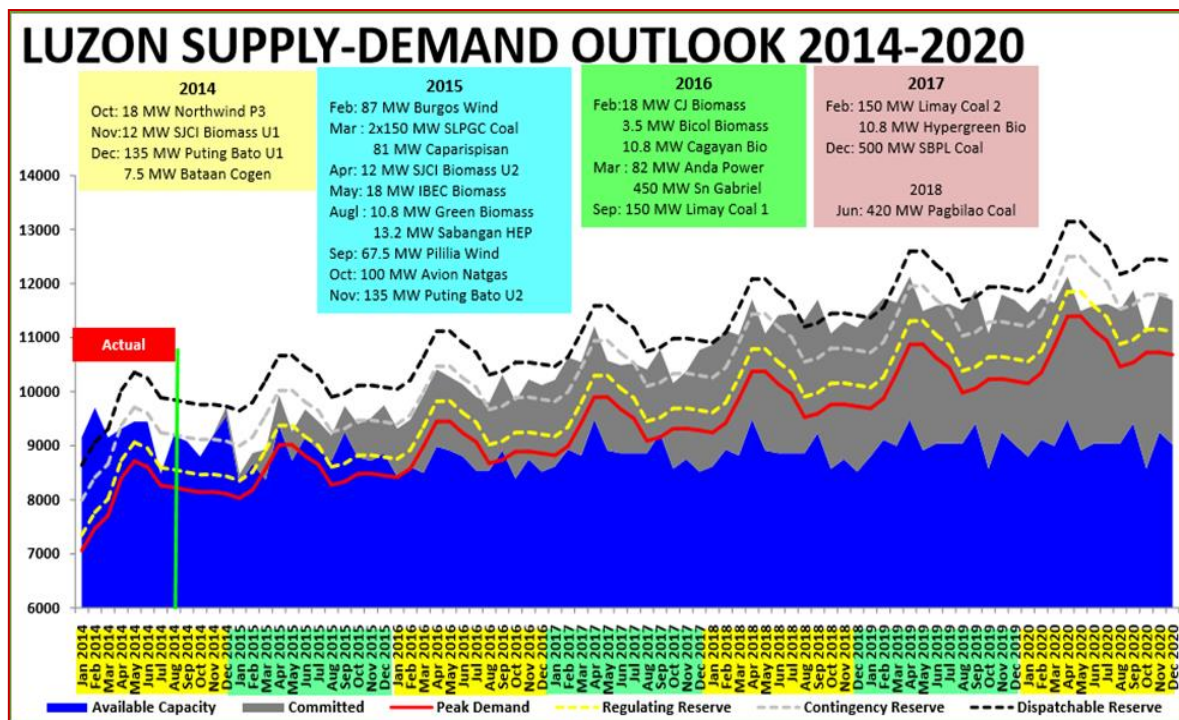


Source: DOE PDP, 2016-2040

Figure 1. Philippines Demand-Supply Outlook, 2016-2040

2.2.2 Shortage of the Luzon Grid in Electric Power Capacity

The DOE Power and Supply-Demand Outlook for 2014-2020 as presented in **Figure 2**, shows an increasing power demand in Luzon Grid at an average annual growth rate (AAGR) of 4-5%. With this projection, an additional capacity is needed on top of the already committed power projects. In order to address the gap, the PEI has proposed to install its Project at Barangays Dela Paz Proper and Ilijan, Batangas City. Upon expected commercial operations in 2024, the proposed Project's capacity of 1,700MW and its annual associated energy of 6,307,200 MWh shall be made available and provided to the Luzon Grid.



Source: DOE PDP, 2014-2020

Figure 2. DOE Supply-Demand Outlook in Luzon, 2014-2020

2.2.2 Socio-Economic Benefits

With the proposed Project, there will be opportunities for employment, local business growth, increased government revenues (through local and national taxes and permitting fees), and development assistance to the host communities. Brisk business opportunities for the local suppliers around the area will come during the construction and operation phases of the proposed Project.

Increased Internal Revenue Allocation

The taxes collected from the proposed Project, which include property tax, remittance, and corporate income tax, would be an additional income for Barangays Dela Paz Proper and Ilijan and the City of Batangas through the increased Internal Revenue Allocation (IRA).

Employment Opportunity

The proposed Project will generate additional jobs as it will require manpower during construction and operation phases. PEI will require the contractors to prioritize hiring of qualified residents of Barangays Dela Paz Proper and Ilijan and other barangays in Batangas City during project implementation. It is expected that the proposed Project will need an estimated number of 150 workers during construction and an estimated number of 100 personnel during commercial operation. PEI shall closely coordinate with the other employment service offices in hiring local personnel for the proposed Project.

Corporate Social Responsibility

The host barangays will benefit from the Corporate Social Responsibility (CSR) Programs of PEI which include programs such as the following:

1. Participation in Brigada Eskwela
2. Projects that will be funded by DOE ER 1-94

DOE ER 1-94 Fund

One centavo for every 1 kWh of electricity sold will go directly to the trust funds of the host beneficiaries such as the LGUs of regional, provincial, city, and barangays and other indigenous people. The fund will be used for local projects in the following categories and respective budget shares:

- 50% - Electrification Fund (EF) for Distribution Utilities
- 25% - Development and Livelihood Fund (DLF)
- 25% - Reforestation, Watershed Management, Health and/or Environmental Enhancement Fund (RWMHEEF)
 - The DLF and RWMHEEF shall be allocated in the following manner:
 - Host Municipalities or Cities – 35%
 - Host Province/s – 30%
 - Host Barangay/s – 20%
 - Community and People Affected – 5%
 - Host ICCs/IPs – 5%
 - Host Region – 5%

In the absence of **Community and People Affected** funds allocated for the same shall form part of the fund for the host barangays.

In the absence of **Indigenous Cultural Communities (ICC) or Indegenous People (IP)** funds allocated for the same shall form part of the fund for the Host Region.

2.3 Project Alternatives

2.3.1 Site Selection

There is no other alternative site considered for the proposed Project other than the 60 hectares located at Barangays Dela Paz Proper and Ilijan. And also, one of the considerations in the site selection is the proximity to the existing LNG pipeline of Shell Malampaya.

2.3.2 Technology Selection

The proposed Project will utilize a combined cycle gas turbine technology for the following reasons:

- **Higher Efficiency.** The higher the exhaust temperature and pressures at the turbine outlet, the higher is the efficiency.
- **Lower Emission Levels.** Due to high efficiency it will result to lower fuel consumption rates, thus there will be lower emission of combustion gases such as Carbon Dioxide (CO₂), Carbon Monoxide (CO), Sulfur Oxides (SO_x) and Nitrogen Oxides (NO_x), and Particulate Matters (PM).
- **The use of LNG as fuel** will have an emission that is more of environment-friendly compared to other fossil fuel-fired thermal power plant.

2.3.3 Resources

1. **Water:** The water requirement of the proposed Project will be sourced from the area based on the results of the study that will be conducted by PEI.
2. **Seawater:** This resource will be used as coolant medium in the condensing system of the steam turbine. Abundant supply of this resource which will be required in large quantity during the operation is one criteria that favour the siting of the plant in the area. Seawater can also be used as alternative source of domestic and process water through desalination process.
3. **Fuel Supply:** The first option of LNG supply is still the Shell-Malampaya system. The second option is LNG will be sourced through import. The presence of the existing LNG-fired power plant near the area where the Project will be constructed will be an advantage since economic of scale will play a major role in pricing the LNG.

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Panasia Energy, Inc. Barangays Dela Paz Proper and Ilijan, Batangas City

2.4 Project Components

Table 1 presents the major components, support facilities and pollution control devices for the proposed Project.

Table 1. Project Major Components and Auxilliaries

Components	Specification/Description
Gas Turbines	The type of gas turbine that will be utilized in the proposed plant is of high efficiency class type. A gas turbine is a combustion engine that convert natural gas or other liquid fuels to mechanical energy. This energy then drives a generator that produces electrical energy.
Compressors	Compressor section of the gas turbine engine has many functions. Its primary function is to supply air in sufficient quantity to satisfy the requirements of the combustion burners of the gas turbine. It also provides cooling air to the blades of the gas turbine. Since gas turbine and compressor are installed in a single shaft, manufacturer/brand of these major equipment are the same.
Steam Turbine	The system will be used to convert the heat energy of steam from heat recovery steam generator to mechanical energy. Steam turbine is the prime mover of the generator.
Generators	This is an electrical equipment that converts the mechanical energy of the gas turbine into electrical energy. Steam turbine and gas turbine have its own generator.
Transformers	This is an electrical device that converts the voltage of an electrical power from low to high depending on the points of use. In a power plant there are numbers of transformers that categorized as low voltage, medium voltage, and high voltage. The main transformers of the power plant converts the electrical power generated at low voltage from the generator to high voltage of the transmission lines.
Water Treatment Plant	To process raw water either from deepwell or seawater in order to come-up of domestic water and demineralized water for the usage of the power plant in its operation.
Heat Recovery Steam Generators	This equipment is for the production of steam, which is the prime mover of the steam turbine. It utilizes the exhaust of the gas turbine in the form of combustion gases as heating medium.
Condenser and its cooling system	The system is a must in a steam turbine operation in order to have recirculation of the demineralized water and primarily to save on demineralized water requirement. Steam from the steam turbine is condensed at the condenser where the cooling medium, in this proposed power plant, is seawater.
Wastewater Treatment Plant	The system will be put in placed in order to treat all the identified wastewater generation from plant processes to comply with the existing effluent standards.

2.4.1 Main Components

The main components of the proposed 1,700 MW Batangas Combined Cycle Gas Turbine Power Plant shall be as follows:

Major Components	No. of Unit
Gas Turbines	4
Compressors	4
Generators for GT	4
Generators for ST	2
Steam Turbines	2
Heat Recovery Steam Generators	4
Water Treatment Plant	1
Wastewater Treatment Plant	1
Electrochlorination Plant	1
LNG Terminal Facility (optional)	1
Switchyard Facility	1

2.4.2 Support Facilities

The support facilities include:

Facility Name	Quantity
Pier and Jetty	1 lot
Control Room Building	1 unit
Administration Building	1 unit
Maintenance Building	1 unit
Staff House Building	1 unit

2.4.3 Pollution Control

The pollution control system for the proposed Project includes:

Facility/System ID	Quantity
Waste Water Treatment Plant	1 lot
Bund Walls 1. Liquid fuel tank 2. Acid (HCl or H ₂ SO ₄) tank 3. Caustic Soda tank	One for every tank
Sewage Treatment Plant	1 lot
CEMS	1 probe for every stack
Oil-water separator	1 lot

2.5 Project Schedule

Upon issuance of Environmental Compliance Certificate, the proposed Project will be implemented in two (2) phases. Each phase is estimated to be completed in thirty (30) months.

2.6 Project Cost

The proposed Project and its components are estimated to cost around PhP 63B.

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2.7 Project Phases, Key Environmental Aspects, Wastes, Issues, Built-in Measures

Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Prevention/Mitigation/Enhancement Measures
CONSTRUCTION PHASE			
	LAND		
Cut and fill activities	Land use and Classification	<ul style="list-style-type: none"> Change/Inconsistency in Land Use 	<ul style="list-style-type: none"> The Project site is within the vicinity of an existing power plant which is within an industrial area and most likely consistent with the general land use of Batangas City.
Construction of the proposed Project	Geology/ Geomorphology	<ul style="list-style-type: none"> Encroachment to ECA 	<ul style="list-style-type: none"> The Project site has not encroached in an ECA.
		<ul style="list-style-type: none"> Change in surface landform/terrain/slope 	<ul style="list-style-type: none"> Designate a competent person to prepare a proper grading plan including a cut and fill strategy.
		<ul style="list-style-type: none"> Change in sub-surface underground geomorphology 	<ul style="list-style-type: none"> The excavations done at the site and its peripheral roads shall cause permanent but low level of disturbance. Strict conformance to the recommendations of the geotechnical study
Site Preparation, and Earthwork	Pedology	<ul style="list-style-type: none"> Soil erosion 	<ul style="list-style-type: none"> Construction of soil erosion control measures either by engineering structure or planting of grasses/trees. Placement of excavated soil materials in appropriate stockpile areas with avoidance of stockpiling along drainage ways/creeks. The soil stockpiles will be covered with plastic sheets/geotextile, or planted with grasses/ small shrubs for erosion control.
	Terrestrial Ecology	<ul style="list-style-type: none"> Vegetation removal and loss of habitat 	<ul style="list-style-type: none"> Trees will be cut only when necessary and with applicable permit from DENR.
		<ul style="list-style-type: none"> Threat to existence and/or loss of important local species 	<ul style="list-style-type: none"> There are no ecologically sensitive habitats such as mangroves, etc. that will be affected by the proposed Project.
		<ul style="list-style-type: none"> Threat to abundance, frequency and distribution of important species 	
		<ul style="list-style-type: none"> Hindrance to wildlife access 	
	WATER		
Water consumption during construction	Hydrology/ Hydrogeology	<ul style="list-style-type: none"> Change in drainage morphology/inducement 	<ul style="list-style-type: none"> The water requirement of the proposed Project will be sourced from the area based on the result of the study which will be conducted by PEI.

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Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Prevention/Mitigation/Enhancement Measures
		<ul style="list-style-type: none"> of flooding/reduction in stream volumetric flow • Change in stream, lake water depth • Depletion water resources/ competition in water use 	<ul style="list-style-type: none"> • PEI shall implement necessary measures to conserve water and reduce water usage.
Mobilization of construction equipment and materials Generation of domestic waste	Water Quality	<ul style="list-style-type: none"> • Degradation of groundwater quality 	<ul style="list-style-type: none"> • Provision of containment structures and canals in the storage areas for oil and the motor pool area • Return of contaminated cans/containers of hazardous materials such as paints, thinners, wood preservatives and others to the supplier/producer for treatment and safe disposal • Regular monitoring of groundwater quality
	AIR		
Mobilization of Construction Equipment and Materials	Meteorology/ climatology Air Quality and Noise	<ul style="list-style-type: none"> • Change in local climate and local temperature • Degradation of Air Quality 	<ul style="list-style-type: none"> • PEI shall establish a buffer zone and native species shall be used for vegetation, as these would be expected to have good survival rate. • Every main haul road shall be paved with concrete, bituminous materials, hardcores or metal plates; keep the road clear of dusty materials; spray the road with water or a dust suppression chemical so as to maintain the entire road surface wet; and immediately before leaving a construction site, every vehicle shall be washed to remove any dusty materials from its body and wheels; • Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • The working area of any excavation or earth moving operation shall be sprayed with water or a dusty suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet; • Exposed earth shall be properly treated by compaction or by vegetation planting within six (6) months after the last construction activity on the construction site or part of the construction site where the exposed earth lies;

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Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Prevention/Mitigation/Enhancement Measures
			<ul style="list-style-type: none"> Any stockpile of dusty material shall be either covered entirely by impervious sheeting; placed in an area sheltered on the top and the three (3) sides; or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet. Regular monitoring of ambient air (TSP) quality.
		<ul style="list-style-type: none"> Increase in ambient noise level 	<ul style="list-style-type: none"> Scheduling certain high noise emitting works to more acceptable times of day Use of the most environmentally acceptable equipment which is properly maintained and silenced Use of the least intrusive method of work Proper instruction and supervision of staff Acoustic screening Defective equipment/parts with abnormal noise and/or vibration will be either repaired replaced Schedule use of equipment/machines emitting high noise like pile driver during day time operation while, minimize use during night time operation All employees working on site will be provided with proper ear protectors Conduct noise level monitoring
	PEOPLE		
Implementation of livelihood projects	Local residents	<ul style="list-style-type: none"> Increase income for residents 	<ul style="list-style-type: none"> Positive Impact
Hiring of workers	Local residents	<ul style="list-style-type: none"> Increase in local employment 	<ul style="list-style-type: none"> Priority employment for qualified local residents without discrimination to women
Increase in taxes and revenues	Local community	<ul style="list-style-type: none"> Improvement in infrastructures and social services 	<ul style="list-style-type: none"> Diligent payment of taxes/revenues
Accidents	Local residents	<ul style="list-style-type: none"> Construction-related hazards 	<ul style="list-style-type: none"> Environment, health and safety training prior to construction
OPERATION PHASE			
	LAND		

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Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Prevention/Mitigation/Enhancement Measures
Foundation Stability	Geology	<ul style="list-style-type: none"> Subsidence and Liquefaction 	<ul style="list-style-type: none"> Structural monitoring of buildings/facilities especially after each earthquake Formulation of detailed Emergency Preparedness and Response Plan
Accidental oil spill	Pedology	<ul style="list-style-type: none"> Soil contamination 	<ul style="list-style-type: none"> Provision of oil spill kit on-site. Regular monitoring of soil quality.
WATER			
Generation of domestic waste water Generation of oily wastewater and process wastewater	Water Quality	<ul style="list-style-type: none"> Degradation of groundwater quality 	<ul style="list-style-type: none"> Installation of Oily Wastewater Treatment System that will efficiently treat oily wastewater Installation of STP to treat the domestic wastewater generated Proper handling and storage of diesel, lubricants in covered areas with impermeable flooring and installation of proper bund walls Daily supervision of possible leaks or spillages in the fuel storage tanks Provision of oil spill kit on-site. Installation of wastewater treatment plant
AIR			
Utilization of diesel for fuel	Air Quality	<ul style="list-style-type: none"> Degradation of Air Quality 	<ul style="list-style-type: none"> Conduct ambient air quality monitoring and stack emissions testing
Use of diesel generator engines	Noise Quality	<ul style="list-style-type: none"> Increase in ambient noise level 	<ul style="list-style-type: none"> Use of the most environmentally acceptable equipment which is properly maintained and silenced Proper instruction and supervision of staff Acoustic screening It is advisable that electrically powered plant shall be preferred, where practicable, to mechanically powered alternatives. If mechanical powered plant will be used, it shall be fitted with suitable silencers and mufflers Defective equipment/parts with abnormal noise and/or vibration will be either repaired or replaced All employees working on site will be provided with proper ear protectors Conduct noise level monitoring
PEOPLE			
	Waste Management	<ul style="list-style-type: none"> Generation of sewage/solid waste 	<ul style="list-style-type: none"> Provision of STP, portalets and latrines, no litter signs, waste can Applying the hierarchy of measures: Reduce, Segregate, Re-use, Recycle and Dispose

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Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Prevention/Mitigation/Enhancement Measures
			<ul style="list-style-type: none"> Proper disposal of non-recyclable wastes through an accredited contractor
Hiring of workers	Population	<ul style="list-style-type: none"> Change in population (size, distribution) In-migration 	<ul style="list-style-type: none"> Priority hiring of qualified local residents in coordination with the City and host barangays Training program and skill transfer for local residents
	Social services	<ul style="list-style-type: none"> Overburdening of public social services 	<ul style="list-style-type: none"> Priority hiring of qualified local residents On-site medical clinic staffed by at least a doctor and a nurse Provision of an ambulance
	Health	<ul style="list-style-type: none"> Introduction of disease between migrant and local workers 	<ul style="list-style-type: none"> Clean bill-of-health as a condition for employment Medical check-up shall be part of the CSR program of PEI to monitor the occurrence of unusual health problems that can be associated with the proposed Project. Provision of potable water, sanitary facilities and garbage bins for workers Provision of Medical clinic and a safety officer to monitor safe working conditions Provision of Medical/First Aid kits in all work places
Operation of the power plant	Local residents	<ul style="list-style-type: none"> Increased social and economic financial activity 	<ul style="list-style-type: none"> Positive impact, no mitigation required
	Workers and properties	<ul style="list-style-type: none"> Fire hazard 	<ul style="list-style-type: none"> Provision of fire suppression systems, fire detections systems, fire host stations and portable fire extinguishers
ABANDONMENT PHASE			
	LAND		
Decommissioning	Pedology	<ul style="list-style-type: none"> Soil contamination 	<ul style="list-style-type: none"> The Abandonment Rehabilitation Plan shall be followed and rendering the Project area free of soil contamination
	Terrestrial Ecology	<ul style="list-style-type: none"> Increase biodiversity due to retention of buffer zone 	<ul style="list-style-type: none"> Positive impact, no mitigation needed
	WATER		
Disposal of waste	Groundwater Quality	<ul style="list-style-type: none"> Disposal of wastes may lead to possible impacts from spills and 	<ul style="list-style-type: none"> Proper disposal of wastes. Collection of spills

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Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Prevention/Mitigation/Enhancement Measures
		discharges of contaminants affecting groundwater quality	
	AIR		
	Air Quality and Noise	<ul style="list-style-type: none"> • Generation of noise • Generation of dusts 	<ul style="list-style-type: none"> • Proper maintenance of vehicles • Use of noise suppressors/mufflers • Limiting noisy activities during daytime • Watering during dismantling to minimize dusts • Conduct ambient air (TSP) and noise level monitoring
	PEOPLE		
Hiring of workers for demolition and abandonment activities	Local residents	<ul style="list-style-type: none"> • Increase in local employment during abandonment • New skills developed for decommissioning may be marketable elsewhere 	<ul style="list-style-type: none"> • Priority for qualified local residents
Loss of jobs/employment		<ul style="list-style-type: none"> • Reduction in employment opportunities to include the staff of local contractors with long-standing service contracts with the project, for example, maintenance services, site transport services and franchised catering companies. 	<ul style="list-style-type: none"> • Six (6)-month notice prior to termination of contract to give ample time to look for next employment • Effective management via consultation, planning and communications with affected workers • Financial support within a human resources plan
	Demographic	<ul style="list-style-type: none"> • Out migration of affected project personnel to seek work elsewhere 	
Decommissioning activities	Local Community	<ul style="list-style-type: none"> • Nuisance 	<ul style="list-style-type: none"> • Formulation and implementation of decommissioning impact management plan

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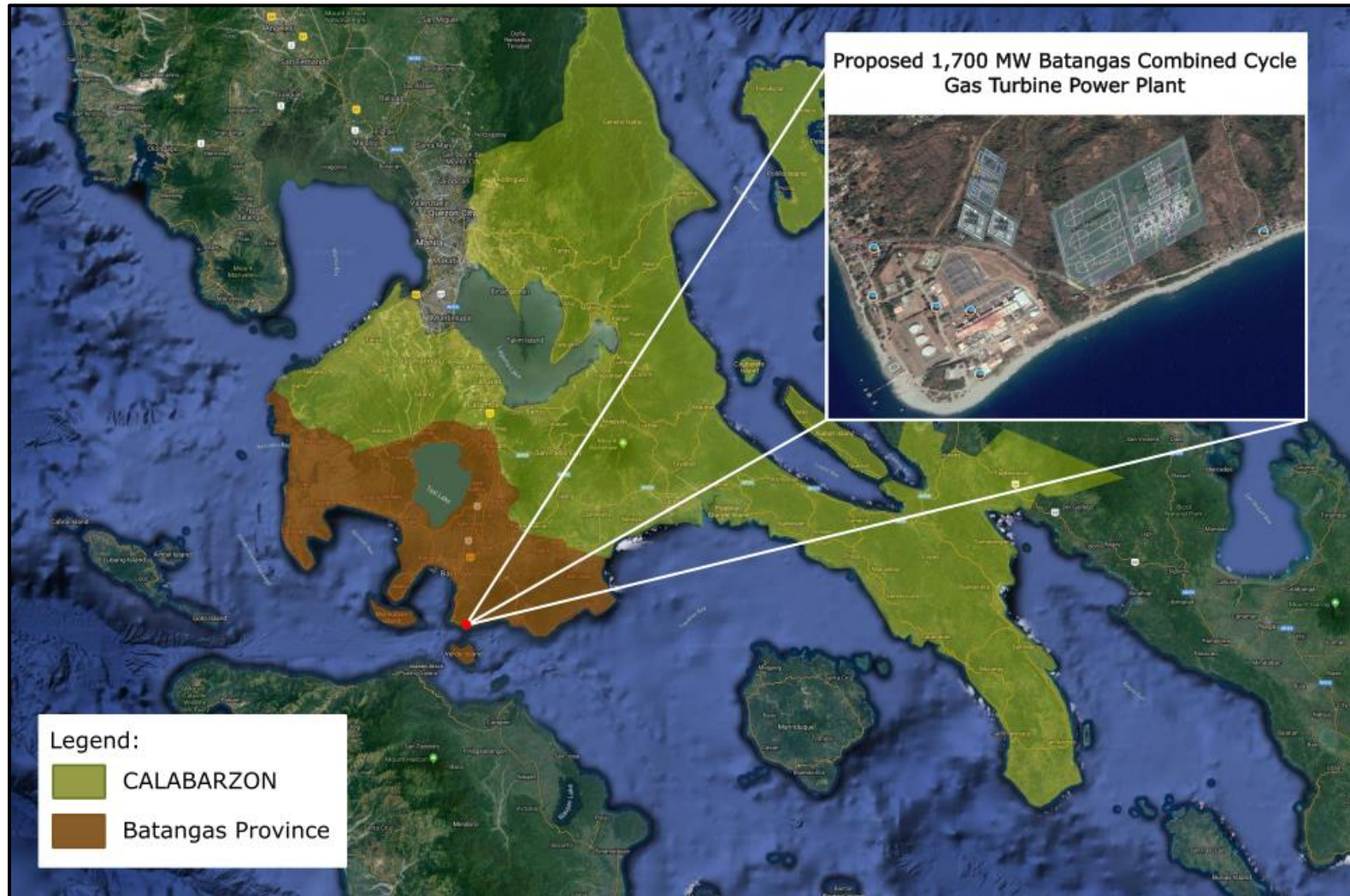
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Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Prevention/Mitigation/Enhancement Measures
		<ul style="list-style-type: none">Decommissioning activities may cause local disturbance or damage through increased road traffic, noise, etc.	



Annex 1. Location Map of the Proposed 1,700 MW Batangas Combined Cycle Gas Turbine Power Plant Project



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