Environmental and Social Compliance Audit

September 2019

THA: Energy Absolute Green Bond for Wind Power Project

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Asian Development Bank

ABBREVIATIONS

ADB – Asian Development Bank

NOTE

(i) In this report, "$" refers to United States dollars.

This environmental and social compliance audit report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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Energy Absolute Public Company Limited – Hanuman 260MW Wind Project

Environmental and Social Management System Audit

September 2019

Asian Development Bank

Customer Details

Customer Name:	Asian Development Bank
Project Name:	Environmental and Social Management System Audit
Client Reference:	SC 112852 REG:

DNV GL Details

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Document Details

Title:	Energy Absolute Public Company Limited Environmental and Social Management System Audit
Date of issue:	20 September 2019

Project Team

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for DNV GL Business Assurance Australia

31 July 2019

Mark Robinson
Manager, Sustainability Services
DNV GL – Business Assurance

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A. INTRODUCTION

This document has been created to detail the Audit executed for the Asian Development Bank's (ADB's) Safeguards Environmental and Social Management System Audit of the entity Energy Absolute Public Company Limited (EA). This report has been produced to present the context, procedures, findings and Corrective Action Plan of the Environment and Social Due Diligence Assessment. This assessment has been based on the requirements of the ADB Safeguards Policy Statement 2009 (SPS 2009) and where available and applicable, local regulations and requirements. The purposed of this report is to provide a narrative context, findings summary and discussion of the outcomes, lessons and process completed as a part of this process. This report is to be followed by works to conduct a Climate Bonds Standard Verification of the proposed.

1. BACKGROUND

1.1 Corporate Background

EA was established in 2006 and has grown to become one of Thailand's largest energy companies. EA's main businesses are currently solar PV and wind renewable energy generation and biodiesel production (largest producer in Thailand) and distribution. EA has acquired a lithium battery manufacturer in Taipei,China and is looking to expand that capacity into Thai based battery manufacturing to expand into electric vehicle manufacture, sales and service/charging. The EA capitalisation was reported to currently be approximately USD 6 billion.

EA has controlling interest in four solar PV projects with a total capacity of 278 MW and two wind projects with a capacity of 386 MW.

1.2 Project Background

ADB is considering a THB 3 billion (~USD 95 million equivalent) investment into EA's 2019 green bond issuance. The bond is proposed to be issued as a corporate bond with all proceeds used to refinance the debt associated with EA's 260 MW Hanuman Wind Farm in Chaiyaphum Province in north eastern Thailand. The proposed issuance is to be EA's first green bond and is proposed to be verified and certified under the Climate Bonds Initiative (CBI) Climate Bonds Standard (CBS) and also the ASEAN Green Bond Standards (ASEAN GBS).

The EA Green Bond is proposed to raise THB 10 billion (~USD 320 million equivalent). The issuance will be spread over multiple tranches including 3, 5, 7 and 10 year tranches. The 3, 5 and 10 year tranches are proposed to amount to THB 7 billion and aimed at a range of investors, with the remaining 7 year tranche of THB 3 billion being fully subscribed by ADB as a cornerstone investor.

The green bond's proceeds will be used to refinance the existing debt for the 260 MW Hanuman wind farm in Chaiyaphum Province in north eastern Thailand. The Hanuman Wind Farm is part of the long-

corporate growth strategy of EA, which seeks to make investments into renewable energy generation, energy storage and electric vehicles/transport in the region. The project achieved COD in April 2019 and the Company is currently seeking long-term financing. CONFIDENTIAL INFORMATION DELETED the Company is seeking to raise approximately THB10 billion through the proposed green bond issuance.

EA's strategy aligns with Thailand's Alternative Energy Development Plan, 2018 - 2037 , which sets a target to increase the share of renewable energy and alternative energy used for power generation more than 30% by 2037.

1.3 Hanuman Wind Farm

The Hanuman Wind Farm is a collection of five projects split into three clusters of wind turbines with substations located in the south western portion of Chayaphum Province, Thailand approximately 270km north of Bangkok. As illustrated by the turbine location map below, projects 5 and 9 are at the southern end, 10 is located in the central area and 1 and 8 are located to the north.

Table 1: Generation Capacity of the 5 Hanuman sub projects.

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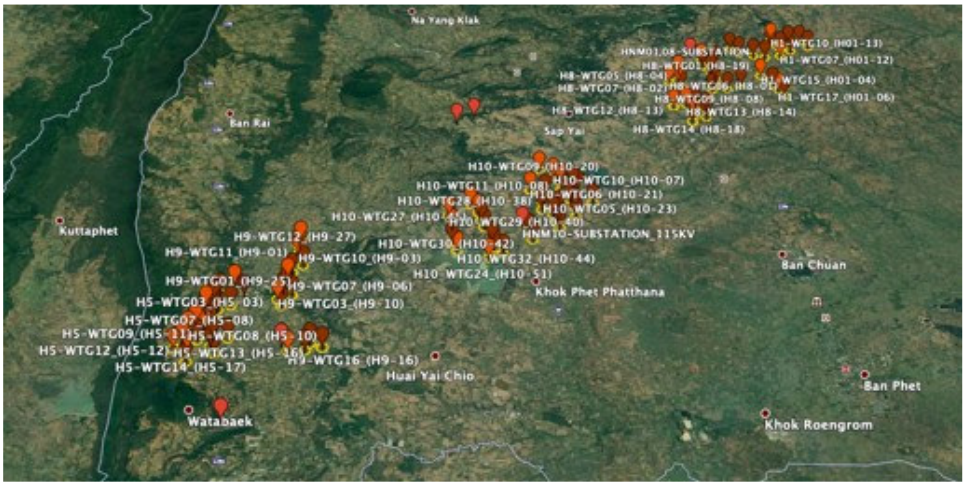
Sub Project	Generation Capacity (MW)
HNM1	45
HNM8	45
HNM5	48
HNM9	42
HNM10	80
Total	260

Figure 1. Turbine and substation locations for Hanuman Wind Farm.



The Hanuman Wind Project utilises 103 Siemens Gamesa 2.5MW wind turbines with a hub height of 153 meters and rotor diameter of 126 meters. The turbines have a wind speed cut in of 3m/s

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Figure 2. HNM01 and HNM08 transmission layout.

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Figure 3. HNM05 and HNM09 transmission layout.
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Figure 4. HNM05 and HNM09 transmission layout.
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A 115kV line was constructed under supervision from the Provincial Electricity Authority (PEA). The boundary of the project is the Electricity Generating Authority of Thailand (EGAT) substation, which includes the revenue meter into the electricity grid. The project Commercial Operating Date (COD) for the project was achieved progressively from 25 January 2019 to 13 April 2019.

2. APPROACH, METHOD AND SCOPE OF WORKS

The scope of the project is to provide an external audit of the environmental, social, health and safety performance of the client's (EA's) Hanuman Wind Project in accordance with the ADB Safeguard Policy Statement[1] General Corporate Finance modality requirements; and assist and advise the client (EA) to ensure projects' compliance with ADB's safeguard policy requirements. The work is has been conducted on

a) corporate audit of the Company's current Environmental and Social Management System (ESMS) or equivalent, and;
b) compliance audit of the Company's current performance of its Hanuman Wind Project in Thailand against the objectives, principles, and requirements of ADB's SPS (2009)[1], Social Protection Strategy (2001), Policy on Gender and Development (1998), and the Public Communication Policy (2011). Compliance with applicable local laws and regulations.

Specifically, this assessment is to:

i) Assess the capacity of the Company to manage and address all relevant environmental and social impacts and risks of the Hanuman Wind Project and the proposed subprojects or activities, particularly the issues identified in the SPS Safeguard Requirements 1-3;
ii) Assess the Company's compliance with the applicable national and local laws and regulations of the jurisdiction in which the Hanuman Wind Project operates that pertain to environmental and social matters, including those laws implementing host country obligations under international law;
iii) Assess the Company's human resource policy and practices and its gender responsiveness and its compliance with national labor laws and the international core labor standards, and;
iv) Identify the Company's main stakeholder groups and current stakeholder engagement activities.

[1] ADB's Safeguard Policy Statement, 2009(http;//www.adb.org/dites/default/files/institutional-document/32056/safeguard-policy-statement-june2009.pdf)

2.1 Methodology

2.1.1 Desk Based Reviews

ADB shared an information request list based on which relevant documents on the projects were provided by EA via electronic transmission. The documents provided were reviewed and further relevant information as required was requested by ADB and provided by EA. Some of the documents reviewed include:

EA Corporate Reporting and Policies

- 1.1 EA_Annual Report 2018.pdf
- 1.2 EA_Quality, Environmental, Energy Conservation, OHS policy.pdf
- 1.3 EA_Sustainability Policy.pdf
- 1.4 EA Corporate Environmental Policy _ Certifications.pdf
- 1.5 MANAGEMENT SYSTEM PROCEDURE.pdf
- 1.6 ENVIRONMENTAL RELATED PROCEDURE.pdf
- 1.7 SITE ENVIRONMENTAL OPERATION PROCEDURE.pdf
- 1.8 Health and afety Manual.pdf

ISO and OHSAS Certifications

- EA Biodiesel ISO 9001 2015.pdf
- EA Biodiesel OHSAS 18001 2007.pdf
- EA Biodiesel RSPO.pdf
- EA Headquarter ISO 9001 2015.pdf
- EA SOLAR ISO 9001 2015.pdf
- EA SOLAR ISO 14001 2015.pdf
- EA SOLAR LAMPANG ISO 9001 2015.pdf
- EA SOLAR LAMPANG ISO 14001 2015.pdf
- EA SOLAR NAKORNSAWAN ISO 9001 2015.pdf
- EA SOLAR NAKORNSAWAN ISO 14001 2015.pdf
- EA SOLAR PHITSANULOK ISO 9001 2015.pdf
- EA SOLAR PHITSANULOK ISO 14001 2015.pdf
- EA WIND HADKANGHAN 3_ISO 9001 2015.pdf
- EA WIND HADKANGHAN 3_ISO 14001 2015.pdf
- Planning of Certification to ENERGY ABSOLUTS_PUBLIC-Rev.01.pdf

Organization Structure

- EA_HSE Organization Chart (English version).pdf
- EA_HSE Organization Chart (Thai version).pdf
- ESM Organization Chart.pdf
- ESM_Hanuman Organization Chart.pdf

EA E&S Training Calendars

- 4.1 EA training calendar 2018.pdf
- 4.2 EA training calendar 2019.pdf

EA's grievance redress system

- 6.1. GRIEVANCE PROCEDURE_EngNote.pdf
- 6.2 Form Complaints record.pdf

Environmental, health, safety and social monitoring and reporting system

- Hanuman Initial Environmental Examination Reports 1-5

EA Contractor and subcontractor requirements and procedures

- 9.1 HSE-WI-003_WI Contractor Control.pdf

EA Internal and external EHS training records

- 10.1 Action Plan ISO 9001 ISO 14001.pdf
- 10.2 Confined Space training attendance.pdf
- 10.3 EA training record 2018.pdf

B2. Environmental Compliance Permits

B3. Annual Environmental compliance monitoring reports

B4. Other E&S related permit (e.g. water discharge permit, water extraction permit)

B5. Supporting documents in relation to the provisions of the permit

B7. Organizational structure, roles of on-site management and staff, E&S team

B8. Record of health and safety statistics

B9. Labor related reports submitted to Ministry of Labor and Employment for the last 3 years

B10. Land Documentation

B11. Internal and external EHS training records of relevant staff

B13_14. Technical summary reports, Design Spec

Green Bond Documentation

- B15. EA_Bond Project Summary.pdf
- B16. EA_Term Sheet.pdf
- B19. EA_Green Bond Framework.pdf
- B20. EA_Financial Summary.pdf

Documentation Requested and Provided during the Site Visits

- 1_Land Lease Agreement
- 2_ALRO Legal Case Detail and Rulings
- 3_EA Corporate Presentations
- 5_List of Affected Local Land Owners
- 6_ERC Regulations
- 1_Google Map File of Asset Locations
- 3_EA GHG Offset Project Report
- 4_Hanuman Site Training Program
- 9_WTG Transmission Line
- 11_Design Noise Guarantee
- 12_Transmission Line
- 13_Hanuman Geotechnical and Soil Test Report

2.2.2 Site Meetings

A meeting was held at the Hanuman site office on 1 July 2019 and EA corporate office on 3 July 2019 to introduce the ADB team and discuss the Hanuman project and visit details. EA presented a brief overview of the Projects and discussions were held for the entire assessment and selection of sites for the visits. Meeting participants included:

EA

Chatrapon Sripratum, Assistant Vice President, Energy Absolute
Nathakorn Sripufai, Assistant Vice President, Energy Absolute
Yupachada Chomyart, Assistant Vice President, Energy Absolute
Vivat Khositsakul, Managing Director, Advance Energy Plus
Benjawan Surat, Assistant Project Manager, Advance Energy Plus
(Energy Absolute Consultant)

ADB

Melissa M. Manguiat, Senior Safeguards Officer ADB
Abhishek Singh, Senior Social Safeguard Specialist ADB
Krittayamon Paocharoen, Senior Investment Officer ADB
Mark Robinson, ADB Consultant

The ADB Team also conducted meetings with the following representatives related to the project:

Tha Kup Sub District Government, 2 July 2019

- Tha Kup Sub District Administrator (District containing the Hanuman Projects)

Sai Thong National Park (nearest National Park to Hanuman project), 2 July 2019

- Vorapol Deeprasai, Director, Sai Thong National Park

Bird Expert for Hanuman project, 3 July 2019

- Dr Sakhan Teejuntuk, Assistant Professor of Dept Silviculture, Faculty of Forestry, Kasetsart University

Thailand Greenhouse Gas Management Organization (TGO), 3 July 2019

- Sathit Niamsuwan, Project Manager, CDM and T-VER Monitoring Section

Bird Conservation Society of Thailand, 4 July 2019

- Nancy Gibson, Executive Director, Bird Conservation Society of Thailand
- Ayuwat Jearwattanakanok, Bird Conservation Society of Thailand

3. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

3.1 Applicable EHS Laws

Ministry of Natural Resources and Environment.

Office of Natural Resources and Environmental Policy and Planning (ONEP) is responsible for the regulation and management of the environmental impact assessment (EIA) process in Thailand. Based on "Ministerial Notifications of MoNRE 2012 and 2013" Wind Power Projects are not required to complete and submit EIA or EHIA reports unless these are located in a Class 1 watershed. The project area as defined does not include activities in Class 1 watershed locations.

Ministry of Industry (MOI).

The MOI is responsible for the promotion and regulating the application and operation of various industries. Under Ministerial Regulation No. 24 B.E. 2558 (2015) Factory Act B.E. 2535 (1992), Wind plants are not classified as Group 3 factory and not required in the application of a factory permit.

Energy Regulatory Commission (ERC).

The Energy industry Act (2007) legislated the ERC body to oversee and regulate the energy industry within Thailand. The ERC Code of Practice (CoP) decrees requires projects exempted from the IEE process to submit a CoP report as part of the requirements in the application of the electricity industry operation and generation license/permit. The IEEreport contains information on the following: (i) project description; (ii) current environmental conditions; (iii) environmental and safety assessment; and (iv) environmental and safety mitigation measures. While an COP was not required for the project under regulation, EA prepared an IEE document for each of the 5 Hanuman Sub Projects and submitted this for ERC consideration. The Environmental Assessment/Examination documentation and compliance section discussed the environmental management, monitoring measures, and stakeholder engagement plan throughout the project cycle, from pre-construction to decommissioning phases of the project. The Power Generation Licenses were subsequently issued in January 2018.

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Other relevant National and Local Laws detailed in the following legislation are noted to be relevant to the Hanuman projects:

Environmental

- Environment and Conservation of the National Environment Quality Act, 1992

    - Water quality standards for river, canal, swamp, marsh, lake, reservoir and other public inland water sources
    - Water quality standards for coastal and estuarine water areas
    - Groundwater quality standards
    - Atmospheric ambient air standards
    - Ambient standards for noise and vibration
    - Environmental quality standards for other matters
- Sections 44(3) and 46 of the Enhancement and Conservation of National Environmental quality Act of B.E. 2535 (1992)
- Enhancement and Conservation of National Environmental Quality Act, B.E. 2535, Chapter 4 Pollution Control, Part 4, Section 68
- Natural Resources Management Enhancement and Conservation of National Environmental Quality Act, B.E. 2535, Chapter 3
- Enhancement and Conservation of National Environmental Quality Act, B.E. 2535, Chapter 4 Pollution Control, Part 5

Workplace and Human Rights

- Labour Protection Act B.E. 2541 (1998), Chapter 4 Section 44 – 52 (Child Labour)
- Labour Protection Act B.E. 2541 (1998), Chapter 4 Section 53 – 77 (Wages and Benefits)
- Labour Protection Act B.E. 2541 (1998), Chapter 2 Section 23 (Working Hours)
- The Anti-Trafficking in Persons Act (No.3) B.E. 2560 (2017), section 52 (Forced Labour)
- Labor Relations Act, B.E. 2518 (1975), Chapter 9 (Freedom of Association)
- Occupational Safety, Health and Environment Act B.E. 2554 (2011), Chapter 1 Section 6 (OHS)
- Dormitory Act, B.E. 2558 (2015) (OHS)
- Announcement of Department of Labor Protection and Welfare Personal Protection Equipment (OHS)
- Labour Protection Act B.E. 2541 (1998) , Chapter 1 Section 16 (Harassment)
- Labour Protection Act B.E. 2541 (1998) , Chapter 1 Section 15 (Discrimination)
- Department of Labour Regulation (2006)
- Department of Industrial Work Regulation (2003)
- Department of Industrial Estate Authority of Thailand

Compliance Status

ADB Policy

Applicable ADB policy includes:

Safeguard Policy Statement (SPS), 2009 and;

- Safeguards Requirement 1 (SR1) on Environment
- Safeguards Requirement 2 (SR2) on Involuntary Resettlement
- Safeguards Requirement 3 (SR3) on Indigenous Peoples

In addition to:

- ADB Policy on Gender and Development (GAD), 1998
- ADB Social Protection Strategy, 2001, and
- ADB Public Communications Policy, 2011

Other relevant subject matter guidance:

- IFC Environmental, Health and Safety Guidance for Wind Energy, 2015
- SNH Recommended bird survey methods to inform impact assessment of onshore wind Farms v2 2017
- SNH Monitoring the impact of onshore wind farms on birds - January 2009

3.2 Wind Farms and Sor Por Kor Land

The project is located in an agricultural area of Chaiyaphum Province, Thailand. This agricultural land is owned by the government and leased to farmers on what is called "Sor Por Kor" land. Sor Por Kor is an agricultural title deed system for government land that is transferred for agricultural purposes to needy families and may be transferred across generations within those families. These Sor Por Kor deeds are issued and managed by the Agricultural Land Reform Office (ALRO).

3.3 Land Lease Negotiation and Payment

The land required to construct and operate the Hanuman Wind Farm is owned by the Thai Government and leased to users under Sor Por Kor system (for rural areas associated with turbines, roads, substations and transmission lines) and conventional commercial lease for the Hanuman site office. The agricultural lands upon which the project areas largely sits are primarily utilised for cassava farming. CONFIDENTIAL INFORMATION DELETED

The construction of the project required the attainment of leasehold land from existing agricultural uses. The engagement of stakeholders and development of payment regimes for these activities was based on the process and values used previously on other wind farms in Chaiyaphum Province.. CONFIDENTIAL INFORMATION DELETED Review of the lease documents, consultations with landholders in the region and their Sub Region administrators revealed that they were formally engaged with the relevant parties and were happy and satisfied with the quantum of the payments.

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3.3 Payments to Previous Users and Nearby People

Payments offered to and agreed with previous farmer landholders was based on rates and structures reported to have been previously offered by wind farm projects in the region. The basis for compensation was detailed as follows:

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The list of affected people who were either former occupants of those lands or whose lands were within the defined radius was provided to the ADB team by EA. These documents detail the description of the lands, the rate of payment farmers are entitled to, the signatures of the respective parties and the scanned record of payment or cheque. These contractual engagements have been separated out by EA into WTG (wind turbine), road expansion and setback CONFIDENTIAL INFORMATION DELETEDcategories with records contained within each file. EA has also provided the list of peoples affected by the Hanuman project and the financial summary of the compensation to farmers at the project level. CONFIDENTIAL INFORMATION DELETED The documents provided were reviewed and found to be consistent in the description of compensation and the parties receiving it.

On 2 July 2019, the ADB team met with local people living in the Hanuman Wind Project area who had been affected by the project and had received payments for previous land use incomes and proximity to the turbines. The local Village residents were talked to, amongst them, a woman who held approximately 50 rai of farmland in the area confirmed that she had received the reported rate CONFIDENTIAL INFORMATION DELETED for land forgone to the project and an additional CONFIDENTIAL INFORMATION DELETED for having farmland inside the CONFIDENTIAL INFORMATION DELETEDradius around the turbine. It was understood that her land was affected by the placement of WTG HNM 8-05. Her total compensation from the Hanuman Project was approximately CONFIDENTIAL INFORMATION DELETED . The local people interviewed indicated that they had no complaints or grievances with the project and were happy with the compensation received. When asked if they understood how to raise grievances or complaints with regards to the project they felt comfortable they could have their concerns heard by local representatives who would pass those on to the project community liaison officer.

The payments provided to affected farmers appears to be in line with (and based on) regional benchmarks for previous landholder payments and exceeds regulated requirements. There was no negative livelihood impact as a result of the leasing of land for the project. Local residents in the project area surrounds expressed their satisfaction with the compensation provided and the operation of the project more broadly.

4. AUDIT FINDINGS

4.1. Corporate E&S Review

Energy Absolute PLC "EA" is a Thai business with the vision and purpose of becoming a

leader in alternative energy business using modern technology that is environmentally friendly within the Thailand and internationally.

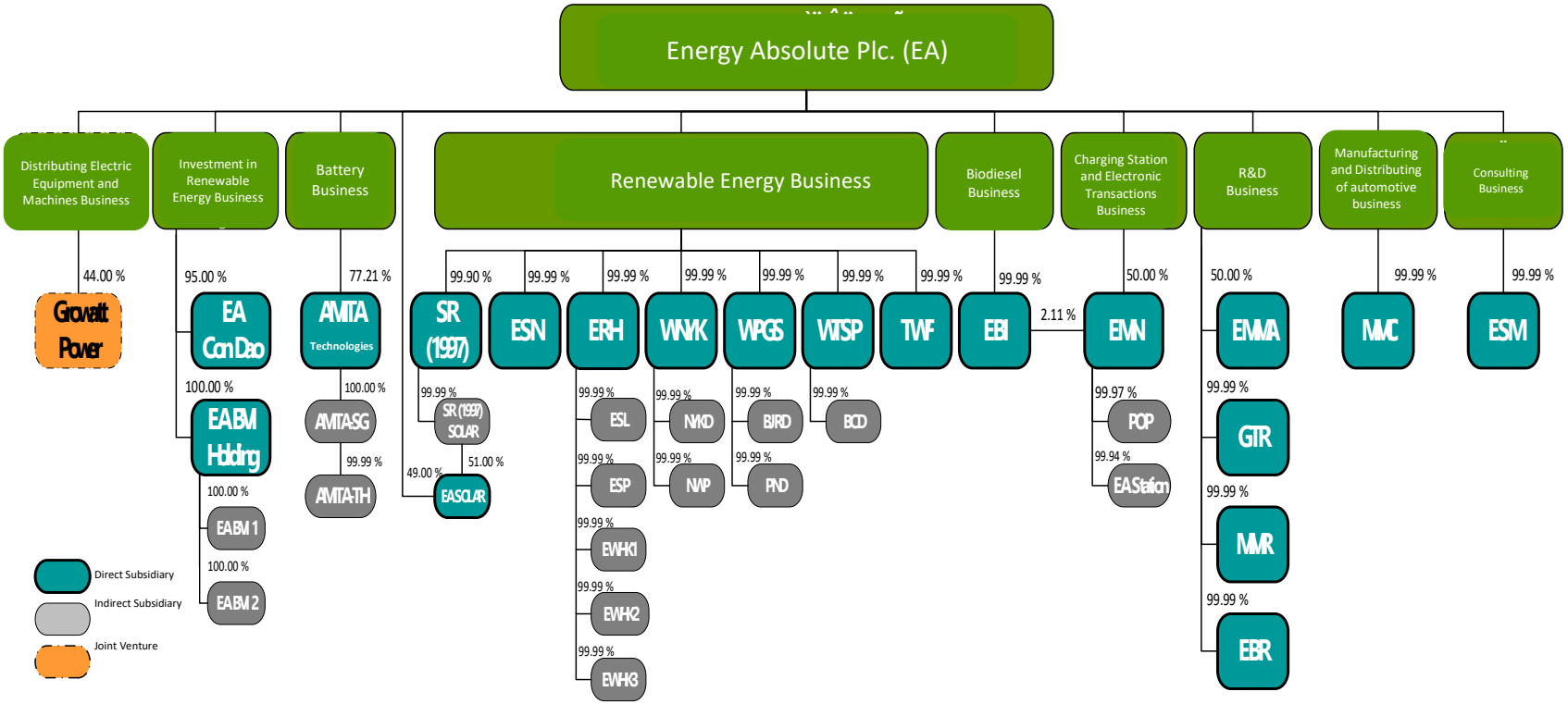
History and Broad Timeline

Energy Absolute was firstly incorporated in 2006 in original name Suntech Palm Oil Co., Ltd with registered capital of THB 50 million and construction of a biodiesel plant at Kabinburi Industrial Estate, Prachinburi Thailand. The registered capital were added from THB 50 to 250, 360, 373 million in 2008, 2009 and 2012 respectively. By 2011 EA began operational and investment expansion into renewable energy generation with the EA Solar Company Limited and the 8 MW solar PV farm at Lopburi. EA also signed a PPA agreement with EGAT for a 90 MW solar PV plant in Muang District, Lampang Province. By 2014 EA had expanded further, setting up numerous entities to handle multiple operations in Solar PV and Wind power generation. In 2016, EA had continued its growth in the Biodiesel, Solar and Wind power sectors and invested in Lithium Battery manufacturer Amita Technologies Ltd. In May 2017, EA invested in the construction of 5 wind power plants in Chaiyaphum province, with a total capacity of 260 megawatts, collectively called the "Hanuman Project", CONFIDENTIAL INFORMATION DELETED. In 2018, EA acquired the remainder of the Amita Technologies entity, effectively making it a subsidiary of EA. In 2018, EA also established the Mine Mobility Corporation with the intention of developing an electric transportation business and launching the development of electric vehicle charging stations within Thailand.

4.1.1 Organizational Structure

The corporate structure illustrates the position of the corporate entities within EA (Figure 5). The renewable energies power plant business of EA is comprised of a series of indirect subsidiaries responsible for the ownership and operation of the renewable energy projects including Hanuman Wind Project, which is made up of 5 individual sub project entities. The Energy Solutions Management entity (ESM) plays the role of operator for the projects held under subsidiary.

Figure 5: Organisational Structure of EA
(as of 31 March 2019.)


Energy Absolute Plc. (EA)
Distributing Electric Equipment and Machines Business
Investment in Renewable Energy Business
Battery Business
Renewable Energy Business
Biodiesel Business
Charging Station and Electronic Transactions Business
R&D Business
Manufacturing and Distributing of automotive business
Consulting Business
44.00 %
95.00 %
77.21 %
99.90 %
99.99 %
99.99 %
99.99 %
99.99 %
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99.99 %
99.99 %
2.11 %
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Gravatt Power
EA ConDao
AMTA Technologies
SR (1997)
ESN
ERH
WNK
WPGS
WTSP
TWF
EBI
EMN
EMMA
MMC
ESM
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99.97 %
99.99 %
EABM Holding
AMTASG
SR (1997) SOLAR
ESL
NWKD
BJRD
BCD
POP
GTR
100.00 %
99.99 %
49.00 %
51.00 %
99.99 %
99.99 %
99.99 %
99.94 %
99.99 %
EABM 1
AMTA-TH
EASOLAR
ESP
NVP
PND
EASeaton
MMR
100.00 %
99.99 %
99.99 %
99.99 %
EABM 2
EWH1
EWH2
EWH3
EBR
Direct Subsidiary
Indirect Subsidiary
Joint Venture

Figure 6: Executive Structure of EA

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Figure 7: EA Quality, Safety, Health, Environment & CSR Corporate Structure

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Figure 8: Energy Solutions Management Structure.

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Figure 9: Wind Farm O&M, Hanuman Project Department Organization Chart.

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4.1.2 Environmental and Social Management System

EA has in place a range of Environmental, Safety and CSR policies and procedures for the management and mitigation of E&S related risks. This assessment has instead considered the scope and effectiveness of existing EA E&S policy and procedures for compliance with the SPS and sough to identify any gaps.

Quality, Environmental, Energy Conservation, OHS Policy

EA has in place a Quality, Environmental, Energy Conservation, OHS policy that applies to all investments and operations under the operational control of EA. The policy has been developed in alignment with ISO standards 9001 for Quality, 14001 for Environment and 18001 for Safety. EA has in place all these ISO certification for it's operational entities where possible. Where these certifications are not yet in place, EA has developed a schedule for their attainment. The Hanuman project is planned to achieve ISO 9001 and 14001 certification within 2019. The policy sets out EA goals and commitments including environmental stewardship and compliance, delivery of quality products and services and commitments to workplace safety and safety for customers.

Sustainability Policy

EA has in pace a Sustainability Policy targeting economic, social and environmental sustainability dimensions. The policy has been structured to facilitate the development and deployment of procedures across a range of dimensions and categories including:

Economic Sustainability

- Corporate Governance
- Business Ethics and Anti corruption
- Risk Management and Crisis Management
- Supply Chain Management
- Innovation in Business and Society

Environmental Sustainability

- Determination of Environmental Policy within the EA group
- Determination of Environmental Programme and support requirements

Social Sustainability

- Adherence in fairness and respect for human rights to all workers
- Employee conduct at all levels
- Provide a social evaluation system
- Corporate Social Responsibility projects

The goals and commitments within the Sustainability Policy are broadly in line with best practice. Even if it does not explicitly mention commitments to or policies on the avoidance of child labour, forced labour , environmental risk assessment and involuntary resettlement, these are aligned with law and regulation required.

Integrated Management System Procedure (Environmental, Quality and Safety)

EA as a part of its work to achieve ISO system certification has developed a Management System Procedure to facilitate the necessary functions for the management and mitigation of environmental, quality and safety risks. This document includes scope and set procedures EMS and QMS operation including:

- Context of the Organization
- Needs & Expectation of Interested Parties
- Determination of Risk and Opportunities
- Establishment of Objectives and Planning to achieve them
- Control of Documented Information
- Management of Change
- Internal Audit
- Management Review
- Nonconformity and Corrective Action
- Continual Improvement

The document appears to be well elaborated for the purposes of operation within the scope of ISO 9001, 14001 and 18001 certification and in line with law and regulation requirement. The Procedure does not specifically address social risks and their mitigation and management.

Environment Management System Related Procedure

The EA Environment Management System Related Procedure follows on from the previous Integrated Management System Procedure to specifically deal with Environmental aspects. The Procedure has been developed for deployment at the EA group level and is relevant to the function of the Quality, Safety, Health, Environment & CSR Shared Service Team. The procedure covers topics including:

- Identification of Environmental Aspect and Impacts
- Legislative compliance
- The information of environmental safety monitoring
- Emergency Preparedness and Response
- Grievance Mechanism
- Internal and external communication

The Procedure sets out the procedures and process for environmental risk identification, reporting and checklist formats, responsible persons and resources and communication conduits. The procedure is considered reasonable in context and should be capable of facilitating the identification, mitigation and management of environmental risks associated with the Hanuman Wind Project. It is noted that an equivalent and dedicated Social Management System Related Procedure did not exist. It is noted that the grievance mechanism outlined in the Environment Management System Related Procedure section 5 should be able to facilitate this function for both social and environmental aspects.

An ESMS developed in accordance with the ADB SPS 2009 was drafted in 2017 for prospective ADB investment at that time. The ESMS was not rolled-out for implementation as ADB's initial investment did not push through. EA is keen in implementing the ESMS for future ADB supported projects.

Site Environmental Operation Procedure

EA has created and implemented a generic site based Environmental Procedure covering:

- Waste Management
- Wastewater Management
- Chemical Control

EA Health and Safety Manual

EA has in place a Health and Safety Manual that appears to be generic for all operational purposes. The manual is relatively detailed and covers a wide range of safety requirements, risks and details on safe work and personal protective equipment. The Manual covers:

- Cleaning and storage of materials in the workplace

- Fire Protection
- Personal Protective Equipment
- Safety in Welding
- Safety in Gas Cut
- Safety in Grinding
- Safety in Working at a Height
- The safe use of Electrical Equipment
- The safety of moving heavy objects by hand
- Safety for using forklifts for moving objects
- The safe use of machinery
- Safety for The Contractor
- Safety in Office
- First Aid
- Signs of Danger and Flammable Substances

It is recommended that Safety Manual be expanded to include all relevant risks on wind power sites.

4.1.3 E&S Training, Competence and Capacity

Table 4 below sets out a summary of E&S resources and capacity related to the Hanuman Wind Project.

It is noted that while the CSR team has group level competence and capacity, team was dedicated site officer level responsible for Environmental issues under supervision of Site Manager and VP QHSE at corporate level. It is recommended that a Hanuman site resource be nominated to be responsible for environmental management at the Hanuman site including monitoring management, compliance management and incident management.

Table 4. E&S Capacity and Resources

Resource	EA
ESMS	Completed and developed in conjunction with the ADB but yet to be deployed. The ESMS was confirmed to be the joint responsibility of the EA VP and new role of Corporate CSR Manager.
E&S Resources	EA corporate level E&S shared services team with Environmental Supervisor and Environmental Officer.
E&S Reporting System	E&S related reporting captured in ISO 14001 Management System. Environmental compliance reporting handled through Permit Officer and Permit Supervisor.
Internal Data systems	Physical and soft data storage managed and maintained at a corporate level. Additional construction related data ad records maintained by EPC contractor.
Human Resources	HR Lead and Department HR and Admin Managers
Training	Managed and conducted by the EA through EA corporate training program. Reported to include E&S/ESMS materials. Training for E&S matters subject to defined training plan.

The management of E&S related training and competence at the corporate level was managed by the CSR Manager (yet to be appointed) in conjunction with internal Training and HR functions. Records of training delivery and staff competence were provided for the previous 2 years. Records of safety inductions and training were reported to be held and available at the site offices. Training

and competence are mentioned within the EA Integrated Management System.

4.2. Hanuman Wind Project E&S Review

4.2.1. Compliance with national and local laws and regulations

The Hanuman Wind Project is not required to undertake regulatory Initial Environmental Examination (IEE) under Environment and Conservation of the National Environment Quality Act, 1992 or Enhancement and Conservation of National Environmental Quality Act, B.E. 2535. The proponent EA, however voluntarily undertook IEEs for the 5 projects during the due diligence process for the investment. The IEEs for the 5 sub project components of the Hanuman Wind Project were initially submitted in December 2015 and subsequently updated in October 2017.

Electricity Operations License and Power Generation Licences were confirmed to

have been obtained as required and were valid at the time of the audit. Other relevant permissions, related to the above local legislations and regulations in section 3.1, including the ground water extraction permits and health and safety certificates relevant to Fire Safety were noted to be valid. No evidence of non-compliance with the other relevant National and Local EHS regulations was observed during the audit.

4.2.2. Initial Environmental Examination

The company prepared the IEEs for submission to Thailand Greenhouse Gas Management Organization's Thailand Voluntary Emission Reduction Program to demonstrate compliance with environmental regulations and demonstrate that the Project has limited negative environmental impacts.

The IEE sets out the record of how risks were identified and in consideration of these, sets out the Environmental and Social Management Plan to mitigate and manage these risks.

The primary E&S impacts and risks associated with the project have been identified as being associated with Land Use, Noise, Biodiversity Impacts and Shadow Flicker during Operational Phase. The effectiveness of the IEEs assessment of these factors is considered in this section.

a. ANTICIPATED ENVIRONMENTAL HEALTH AND SAFETY IMPACTS

Turbine Throw

The IEE identifies Thai regulations (Announcement of Energy Regulatory Commission (ERC) for Safety Distance and Installed Capacity for Wind Energy Project, dated in Thai Government Gazette on 2 6 June B.E. 2558 (A.D.2015)) as having distance requirements for the measurement and consideration of noise impacts as:

- Project boundary shall be covered at least 1.2 times of total height (tower + radius of blade) of WTG
- WTG shall be located at least 1.2 times of total height (tower + radius of blade) from each other
- WTG shall be located at least 3 times of total height (tower + radius of blade) from the nearest house

The safety distance for households is found to be more stringent than the WorldBank Group requirement which is at least 1.5 times of total height (tower + radius of blade) from sensitive receptors.

Noise

The IEE considers noise impacts associated with the project in a number of ways including regulatory requirements, monitoring and testing of noise impacts.

From a regulatory perspective, the IEE considers noise in the context of Thai noise standard Notification of Environmental Board No. 15 B.E. 2540 (1997) under the Conservation and Enhancement of National Environmental Quality Act B.E. 2535 (1992) and Notification of Pollution Control Department, Subject: Calculation of Noise Level Dated August 11, B.E. 2540 (1997). These regulations require a maximum noise impact of less than or equal to 115 dB(A) and a weighted elevated continuous sound for 24 hours of less than or equal to 70 dB(A).

The IEE details noise monitoring being conducted on the 15-20 Oct 2015 over 3 locations for the project in wind conditions of 5-8 m/s. The sampling and methodology used in the IEE is based on the Notification of Environmental Board B.E. 2540 (1997) regarding Noise and Vibration Standard.

The noise model calculation as per the Pollution Control Department, Ministry of Natural Resources and Environment was applied to predict the equivalent continuous sound level during a 24 hour period (Leq24). The results illustrated that all values are not over 55 dB(A) as per Worldbank Group ESH guideline and 70 dB(A) as per the Ambient Noise Standard and according to the Notification of Environmental Board No. 15 B.E. 2540 (1997).

Shadow Flicker

The 2017 IEE report details that WindPro Model was applied to predict shadow flicker impact of the project in 35 observation areas identified as the nearest house, village and community area such as temple, etc . The IEE details results of the study as revealing that some observation areas would receive shadow flicker more than 30 hours per year or 30 minutes per day.

According to the IEE the following sites may breach the Environmental, Health, and Safety Guidelines for Wind Energy 2015.

Table 5. Reported breaches of Shadow Flicker Standard from 2017 IEEs.

Location	Distance From Site	Flicker Hours/Year	Flicker Minutes/Day
Hanuman 5			
Ban Sap Sombun Community (SR03)	1,050 m. from WTG 5	41:16	27
Hanuman 8			
Ban Hin Rong Community (SR03)	800 m. from WTG 10	31:16	21
Ban Wang Sue Community (SR06)	900 m. from WTG 8	29:58	31
Hanuman 9			
Sombun Sawangtham Temple (SR02)	800 m. from WTG 8	68:57	36
Ban Non Sa-nga Community (SR03)	1,150 m. from WTG 5	35:44	40
Tri Pracha Pattanasuksa School (SR04)	1,200 m. from WTG 3	34:50	28
Ban Pradu Ngam community (SR06)	1,200 m. from WTG 1	33:22	25
House located in the east of the project	1,000 m. from WTG 12	35:35	30

The IFC Environmental, Health and Safety Guidelines for Wind Energy state that recommended that the predicted duration of shadow flicker effects experienced at a sensitive receptor not exceed 30 hours per year and 30 minutes per day on the worst affected day, based on a worst-case scenario. Based on the site inspection, there did not appear to be shadow flicker impacts on build structures.

It is recommended that further monitoring at each of the above locations be conducted to define actual impacts during the dates and times of modelled shadow flicker impacts.

Biodiversity

The IEE includes a section on Biological Environmental Resources, which covers biodiversity and in particular, birds and bats. The IEE contains the results of a 3-day Bird and Bat Study in Appendix 1 of the report. This study details the list of birds observed in the nearby protected area and those observed during the study in the Project area. Within the projects area the study identified 70 bird

species. Of these, all had an IUCN status of Least Concern. The study identified CITES listed species including:

Table 6: CITES Status species identified during Bat and Bird Study.

Species	Endemic	CITES Status
Columba livia	Resident Species	App. III
Bubulcus ibis	Resident Species	App. III
Otus bakkamoena	Resident Species	App. II
Glaucidium cuculoides	Resident Species	App. II
Caprimulgus macrurus	Resident Species	App. II
Treron curvirostra	Resident Species	App. II

Of these species the *Glaucidium cuculoides* is classified as Near Threatened nationally.

The IEE identifies the East Asian – Australasian flyway as they only listed risk associated with the project to birds and bats. The IEE notes and concludes that the migratory route does not pass through Chaiyaphum province or project site.

The IEE assessment has limited survey on migratory birds where seasonal paths may vary, to local and regional raptor species or bats.

b. LAND RELATED CONCERNS

Land Use

The IEE includes a section analysing the Human Use Values of the are containing the project and considers this in the context of the project and impacts benefits associated. This includes, housing, density, land use, transportation infrastructure, Economic and social conditions. The IEE also includes a Social Due Diligence report as an Appendix. This report defines the land requirements of the project during construction and operation including quantification of:

- Foundation areas
- Construction related areas
- Internal access roads
- Transmission lines
- Acquisition rights
- ALRO Sor Por Kor lands

Consultation Process

The IEE reports that initial consultations including with ALRO farmers were initiated in 2013. For project impacts, a public consultation for each subproject was conducted during September 2015. There were reported to be 689 people involved including provincial government agencies, local administration organizations, community/villager leaders, project farmer beneficiaries and interested people. The project was setting another public consultation during 25-27 July 2017. Total participants were 1,007 participants. A series of questions and answers exchanged during the period have been recorded in the IEE. Outcomes of the community engagement process determined that:

- The project company will install all required protection systems for safety purpose
- In case there are some people are dead or disable from the project, the project company will take full responsibility to the affected people.
- The project company will strict on the contractor to limit the speed in the community area as well as traffic regulations
- In case of road damage by the activities related to the project, the project company will repair the road to be in a good condition
- The project company will compensate to the affected farmers that the WTG is located as agreed rate CONFIDENTIAL INFORMATION DELETED
- The project company will compensate to the affected farmers who own the surrounding areas of WTG as agreed rate CONFIDENTIAL INFORMATION DELETED

Land Lease Process

The IEE then sets out the land acquisition process utilised for the Hanuman Project including:

- Seeking approval from affected landholders
- Seeking approval from the local village community
- Seeking approval from the Sub district administrative body
- Submission of above approvals to the ALRO for final approval

- Commercial negotiation of EGAT substation land acquisition in accordance with the Thailand Civil Code and Commercial Code and the Thailand Land Code

This section sets out and establishes quantification of the revenue potential for farmland in the region, which is largely dominated by cassava farming. CONFIDENTIAL INFORMATION DELETED. Approximately 148 landholder farmers were identified as having potential impact from the construction and operation phases of the project. The IEE states that these parties were engaged with and entered into commercial contracts for payment accordingly. The IEE also states that crops already in place in affected areas were purchased at an agreed rate where lands had to be converted for the project. The range of impacts for farm lands for any individual landholder were recorded as ranging from 2-41% across all 5 Hanuman project components.

The conclusion drawn in the Social Due Diligence Report in conjunction with the recorded and documented record of compensation and rental payments to affected stakeholders and farmers is considered to be reasonable in the context of the project location, size, scope and impacts.

c. INDIGENOUS PEOPLES

The IEE identifies Thep Sathip and Bamnet Narong districts, ~250 km northeast of Bangkok. Although the area was founded over two centuries ago during the early Rattanakosin period by Lao people from the north, the majority of the people in the project site identify as Thai. The project area and are in which it is located is reportedly not known to be settled by, claimed by or owned by any distinct or vulnerable ethnic/Indigenous Peoples group.

d. GRIEVANCE MECHANISM

A grievance redress mechanism was established for the project including the nomination and setup of a dedicated location for grievance submission during the construction period and continuing through the operational phase of the project. This mechanism is to include the nomination of a Community Relation (CR) Officer tasked with interaction and Consultation with stakeholders and the management of grievances received. The CR officer was noted to be in place during the site visit during the operational phase.

Submission of grievances was proposed in the Social Due Diligence Report to be available to stakeholders in person to the CR Officer, via a dedicated mailbox in the CR Officers office or through the plant manager. An Information Board visible to the community will also be made available to update the community of the ongoing project activities.

The ADB team noted that the Grievance Redress Mechanism currently required stakeholders to engage with the CR Officer directly or to submit mail to the nominated mailbox, the address and location of which was not immediately clear out in the community. It is recommended that the CR Officer place grievance Redress Mechanism instructions and project schedule and action updates in each local village community in the areas surrounding the Hanuman Project as to how grievances

can be communicated and submitted during the current phase of the project and how those will be handled.

4.2.3. Environmental Management Plan

The Hanuman Project has a number of plans and procedures in place to facilitate the operational phase of the wind farm and its related activities, assets, risks and impacts. This section aims to consider how the plans and provisions in place and practices being carried out are working to manage E&S issues and understand if there are any gaps between current practice and ADB requirements and associated guidance.

The IEEs conducted resulted in the development of Management Plans for the mitigation of identified risks during construction and operation, these are titled the Impact Prevention and Mitigation Measures for Construction Period and Impact Prevention and Mitigation Measures for Operation Period.

a. NOISE MANAGEMENT

Construction Period

The mitigation measures set out for noise management and mitigation during the construction phase include a range of measures related to working hours, planning of heavy machinery works and provision of PPE. These mitigation factors are all commonplace for construction activities and represent a reasonable suite of mitigation measures during the construction period. This phase was completed as of the time of audit. There were no noise related complaints from construction vehicles were reported by the community leader who was interviewed.

Operational Period

The mitigation measures for noise management during the operation stage include:

- Machinery (including WTG) maintenance to prevent unnecessary noise. This is likely in reference to the Siemens Gamesa service contract in place, which is backed by a manufacturer and service noise guarantee.
- The conduct of noise contour mapping and utilisation of this to manage noise impacts. This noise monitoring is scheduled to be completed within 12 months of COD. It is noted that the IEE noise monitoring conducted was targeted to domestic Thai regulations and standards and does not reference good international industry practice, e.g. Worldbank Group EHS Guidelines.
- Control of vehicle movements and speeds to limit vehicular noise.
- Provision of PPE to workers functioning near equipment.

Monitoring of noise impacts during the construction period and operational period was scheduled to be conducted at 3 defined site locations including Leq-24 hrs , Leq-1 hr, Lmax and L90-5 min for 3 consecutive days every 6 months during the construction period. It is noted that the IEE noise

monitoring plan is targeted to meet domestic Thai regulations. The noise monitoring plan shall also be aligned with the WorldBank Group Guidelines for Wind Energy and General EHS Guidelines.

b. SHADOW FLICKER MANAGEMENT

Construction Period

No mitigation actions were listed in the IEE in relation to shadow flicker during the construction period. This is not relevant to the construction phase**.**

Operational Period

The mitigation measures for Shadow Flicker during the operation stage include:

- Screen planting of affected properties
- Potential changes to the wind farm operating regime to minimize operation of the offending turbines during times of shadow flicker
- Blades will be coated with a low reflectivity treatment to prevent reflective glint from the surface of the blade. It is unclear from the information in the IEE if this is an existing specification for the project, however the site visit confirmed the coating of the blades to be of a matte finish.
- Provide for relocating affected houses to a suitable proximate location, if necessary.

The mitigation actions stated for the operational period are reasonable remedies for instances of shadow flicker affecting stakeholders. Monitoring is recommended for the locations where the minutes per day shadow flicker were predicted to be approaching the WorldBank Group Guideline limit of 30 minutes per day, particularly during dry period. It is recommended that shadow flicker monitoring of this site be undertaken to confirm the impacts to sensitive receptors. This should at a minimum include all the sites listed in Table 5, above for the relevant affected dates and times.

c. BIODIVERSITY MANAGEMENT

Construction Period

No mitigation actions were listed in the IEE in relation to Avifauna during the construction period. This period would represent an opportunity for bird and bat surveys to be undertaken to identify potential transient migratory species, endemic raptors and bat activity near the project.

Operational Period

The mitigation measures for Shadow Flicker during the operation stage include:

- Use of finish that will reduce blade glint (e.g. matte grey paint) to minimise reflection which possibly blind bird species flying in the area.
- Implementation and conduct of regular monitoring but not limited to carcass retrieval.
- Monitoring frequency increased during migratory season.

- Design the turbine layout to provide adequate spaces between each turbine for movement of birds which would reduce the potential for accidental collision.

Monitoring of bird and bats during the operational period has been scoped to include all WTGs on a weekly basis for the first 2 years of operation. It is noted that the monitoring activities proposed during this period relate to day to day surveillance of the project area by untrained or semi-skilled individual focused on evidence of bird strikes.

d. **STAKEHOLDER ENGAGEMENT**

Construction Period

The plan sets out community engagement activities including coordination with community leaders regarding the works schedule and notification of works timeline, informing public stakeholders of construction and transport schedules including the movement of oversize cargo and vehicles through the project area and surrounding community and the establishment of a CR Officer to monitor social impacts and take care of complaints. It is noted that the proposed mitigation actions do not specify that a Grievance Management System is to be set up or how that is to be deployed to ensure stakeholders understand how they can provide feedback or submit complaints.

Operational Period

The mitigation measures for Stakeholder Engagement during the operation stage include:

- Engage with and support community events such as cultural, religious and other community activities. This is scheduled to be conducted on at least an annual basis.
- Notify public stakeholders of mitigation actions being implemented during the operational phase. This is scheduled to be conducted on at least an annual basis. This is understood to be a part of the CR Officers role in community engagement, however it was unclear how this is being conducted in a methodical fashion across all communities.

Provide a procedure for receiving complaints or suggestions from the community. This is scheduled to be conducted on at least an annual basis. It was noted that there was no clear method to submit grievances or complaints about the project other than direct interaction with the office of the CR Officer or the plant manager.

e. EHS MANAGEMENT

The environmental management plan provisions related to waste management, water quality and flood management, air quality management, traffic management, and occupational and community health and safety are found to be commensurate to the impact of the Hanuman Project.

4.2.4 Site Visit

The site visit conducted aimed to verify the significance of the impacts identified in the IEE and if the measures proposed in the EMP would be sufficient to address the impacts.

Hanuman Wind Project, Chaiyaphum Province Thailand

The Hanuman Wind Project is a 260 MW wind project with five sub-projects split into three clusters of wind turbines with substations located in the south western portion of Chayaphum Province, Thailand approximately 270km north of Bangkok. The site was inspected and a tour of the site was arranged to cover areas of interest. It was confirmed that the 115KV TL are along the existing right of way, used for the main roads. It was also noted during the visit that the project site is mainly used for cassava planting and farming, as identified in the IEEs.

Tha Kup Sub District Administrator

The ADB Team visited the Tha Kup Sub District administration offices and held a meeting with the head administrator and some employees at the project from the local community.

The Administrator was queried about the handling of land acquisition and the payment to farmers who were affected by the project. The Administrator was able to confirm that the claimed rates of compensation were actually delivered to affected farmers in all cases he was aware of. He noted that the payments to farmers were well received and that he was not aware of any grievances or complaints related to land issues.

When queried about what if any grievances or complaints were raised with him about the project, he mentioned the construction period when there were traffic congestion issues and complaints about dust coming from the construction activities. These issues were reportedly resolved fairly quickly once the project construction team was notified. He noted that no issues had been raised with him about the project during the operational period.

The Administrator acknowledged the Supreme Court case relating to the legality of wind farm activities on Sor Por Kor land and confirmed that to the best of his knowledge and understanding that the project had been constructed and operated with legal right to do so and was permitted under law.

Two local security guards who have the responsibility of patrolling 8 and 9 turbines each were briefly interviewed. When asked if they were aware of any complaints regarding the operation of the wind turbines, they replied that they were not aware of any issues. Similarly, when asked if they had seen any evidence of bird strikes around the turbines they replied that they had not seen any dead birds. When asked about the proximity of the nearest dwelling to a turbine that they knew of, they replied that the WTG H01-13 was approximately half a kilometer from a dwelling. They however have not been provided with specific training to identify bird/bat issues such as identifying species which can be struck by the wind turbines.

Sai Thong National Park

The ADB Team visited the Sai Thong National Park, located approximately 60 km North of the Hanuman project. The Director of the National Park, Mr Vorapol Deeprasai was interviewed regarding the presence and abundance of migratory birds, eagles and bats in the National Park and the project area. Mr Deeprasai mentioned that the forest in the national park was host to a range of bird species that were local in range. He noted that he was not very familiar with the project area and that the bird species surveyed in the park were not likely to travel as far as the project area, which is an agricultural low land environment, distinct from the hills of the national park.

A list of birds identified in the most recent survey of the National Park was provided. A search of these species identified the following IUCN Status of NT or higher:

Table 7: Sai Thong National Park Bird Raptor Species or Species of IUCN NT Status or higher

Survey Number	Species	Name	IUCN Status
37	*Chloropsis cochinchinensis*	Blue-winged leafbird	NT
77	*Eurylaimus ochromalus*	Black-and-yellow broadbill	NT
90	*Aviceda leuphotes*	Black Baza (Migratory raptor)	LC
91	*Elanus caeruleus*	Black Winged Kite (Raptor)	LC
92	*Accipiter badius*	Shikra (Raptor)	LC
93	*Spilornis cheela*	Crested serpent eagle (Raptor)	LC

The Blue winged leaf bird and Black and yellow broadbill were noted to be small forest species unlikely to be found in the open flat areas of the project area. The identified raptors however, were noted to have a wide distribution and be known to fly long distances.

The ADB team had conducted a search of the Integrated Biodiversity Assessment Tool (IBAT), which identified a range of species which may be present in the project area. These included IUCN Critically Endangered, Endangered and threatened bird species. Mr Deeprasai was asked whether he was aware of any of the bird species being present in the park or the region. None of the identified species were noted by Mr Deeprasal as being likely found in the Project area (Refer to Appendix 1: IBAT Search and Expert Comments).

Bird Conservation Society of Thailand and BirdLife International

The ADB Team visited the offices of the Bird Conservation Society of Thailand (BCST) in Bangkok on 4 July 2019. Nancy Gibson, Executive Director, Bird Conservation Society of Thailand and Ding Li Yong, BirdLife International were interviewed. The focus of the interview was on the likelihood of the IBAT listed birds being found in the project area, any other bird or bat species that may be found in the project area and how monitoring could be undertaken to establish bird populations in the Hanuman Project Area. BCST noted that the project area in Chayaphum Province has limited avifauna data and that it is difficult to advise on the presence of species with a high degree of certainty. Upon reviewing the birds included on the IBAT list, it was noted by BCST that the two species that may be present in the area include the Yellow breasted bunting and the Greater adjutant. BCST noted that the yellow breasted bunting had been spotted in Kaeng Lawa Just south of Khon Kaen, which is a wintering

ground for species, approximately 100km NE of the project site. Several Hundred of the birds were recorded there recently. BCST also noted that a number of raptor species may be present in the project area including Yellow Greater Spotted Eagle, Eastern Imperial Eagle and potentially other eagle species. BCST noted that Pitchit, which is approximately 140km WNW of the project site is a known eagle and raptor habitat. It contains rice paddies which are a source of food for them. BCST noted that forest species were unlikely to be found around the project area.

BCST when asked about monitoring programs mentioned that a compliant monitoring plan could be designed and implemented for the site and that this sort of activity is something that they have assisted other projects with. They noted that wind maps through the time of the year would be considered in conjunction with known migration events and periods such as September – October when large migratory birds and raptors move through Thailand.

Table 7: Species reported by Bird Conservation Society of Thailand.

Bird Name	**Feedback from Bird Conservation Society of Thailand**
Yellow Greater Spotted Eagle, Eastern Imperial Eagle, other raptors	May be present in project area. Pitchit ~140km WNW of the project site is a known eagle and raptor habitat
Yellow breasted bunting	Kaeng Lawa Just south of Khon Kaen close to project area (~100km) is a wintering ground for Yellow Breasted Buntings. Several Hundred recorded there.

BirdLife International shared that their general knowledge of the countriy is that most raptors migrate along the western flank of Thailand. BirdLife International also shared some of the researches of experts which involved raptors satellite tagging (e.g. Japanese Sparrowhead) which migratory path coincides with the western section of Thailand. This however is noted to be not conclusive for all soaring bird species and further researches have to be undertaken for other species migrating through Thailand.

The analysis of the secondary data and consultations with the relevant stakeholders suggest that the project area falls in a low bird activity area and has low intensity with regard to migration routes of large bodied birds. However, there is still potential for raptors, large migratory birds, bats to be in the project area either endemic to the region or passing through. It was noted that there are five National Parks (Phu Kieong, Sai Thong, Pa Hin Ngam, Sap Langka, Phu Lan Kha Sanctuary, Tat Ton), and some water bodies (not of high conservation value), near the Hanuman Wind Project. It is recommended that a bat and bird survey in accordance with the good international industry practice e.g., SNH Recommended bird survey methods to inform impact assessment of onshore wind farms v2 2017. This would be required to include:

- A scoping survey, which must be done to determine the target species for raptor, threatened and migratory bird species survey during migratory and wintering season;
- The bird and bat survey design is recommended to be developed in conjunction with design the survey with the Bird Conservation Society of Thailand, who have the resources, knowledge and capacity to assist with this work;

4.2.4. Compliance with ADB's Safeguards Policy Statement (2009)

The table below provides the compliance status of the environmental performance of Hanuman Wind Project based on ADB's SPS requirement for Environment (SR 1).

Table 8: Assessment of Hanuman Wind Power Project against ADB SPS SR-1

No.	ADB SPS		Status/Issues	Recommendations
	Requirements	**Compliance**		
1	Environmental Assessment Requirements: Conduct environmental assessment to identify potential direct, indirect, cumulative, transboundary, and induced impacts and risks.	The project is deemed to be classified as category B based on ADB's SPS which implies that the environmental impacts are temporary, short-term, site-specific, reversible and not significant. Impacts can be avoided and/or minimized with the implementation of mitigation measures. **National Law.** The project is not required to prepare an environmental impact assessment (EIA) or Initial Environmental Examination (IEE) report. However, an IEE reports were prepared for the project on voluntary basis.	Based on the review of the IEE and site visit/interviews issues relating to Grievance Mechanisms, Noise, Shadow Flicker and Biodiversity (Bird and Bat) were identified.	The recommendations associated with these findings are detailed in CAP items 2-5.
2	Environmental Planning and Management Implement the EMP and monitor its effectiveness. Document monitoring	Strict implementation of the EMP from pre-construction to decommissioning phases of the project. The EMP should indicate the related institutional or organizational arrangements, monitoring indicator and schedule of implementation.	The EMP of the Project is in the form of Environmental Impact Prevention and Mitigation Measures for both the construction and operational phases in the IEE report. This has been discussed in detail in the Operational Management of E&S issues above.	Site Environmental Protection Procedure be prepared and aligned with the risks associated with wind farm operation Energy Absolute appoint an EHS officer at the

No.	ADB SPS		Status/Issues	Recommendations
	Requirements	**Compliance**		
	results, including the development and implementation of corrective actions, and disclose monitoring reports.	Compliance should not only be through the documentation and submission of reports but also on the actual implementation of the EMP at the project site.	Noise: IEE noise monitoring plan is targeted to domestic Thai regulations and standards and shall apply good international industry practice such as the WorldBank Group EHS Guidelines. Stakeholder Engagement: It was unclear how the CR Officer's role to provide Stakeholder Engagement was being deployed to gather feedback and complaints. Shadow Flicker: The monitoring sites noted in the modelling results to be approaching the Shadow Flicker limit or 30 minutes per day as per the IFC Guidelines will have to be monitored on site to ensure that there will not be adverse impacts to those households. Birds and Bats: Bird and bat monitoring during the operational phase of the project was insufficient to understand the potential impacts to at-risk species.	level to oversee the compliance of biodiversity, water, noise, shadow flicker. safety and municipal and management waste issues, and attend training courses on related topics, together with ESM staff.
3	Information disclosure	Disclosure of the environmental assessment report including the EMP. The IEE should be disclosed in a timely manner, in an accessible place and in a form and languages understandable to affected people and other stakeholders.	The record of stakeholder engagement and disclosure is recorded in the final version of the IEE, which includes sharing of relevant studies, impacts and data with local stakeholders and allowing them to submit questions, concerns or clarifications regarding that information.	The information disclosure related to the project to stakeholders was considered to be reasonable and appropriate for the project.
4	Consultation and Participation	The Company should carry out meaningful consultation with affected stakeholders, including civil society, and facilitate informed participation throughout	One of the requirements of IEE report is the conduct of public consultation prior to construction activities and throughout the project cycle (annually during construction phase and semiannually during operation phase).	It is recommended that the CR Officer place grievance Redress Mechanism instructions and project schedule and action updates in

No.	ADB SPS		Status/Issues	Recommendations
	Requirements	Compliance		
		the project cycle. The consultation should begin as early as the design or planning stage of the project.	Also, it was documented in the IEE report that a consultation the EA had conducted a public consultation meeting was organized by the project company at the meeting room of Tha Kup Sub District Administration Organization, Tha Kup sub-district, Sap Yai district, Chaiyaphum province on 26 July 2017 (13:00 pm to 16:00 pm) – HNM1. There were 162 participants including local officials, Administration Organization and villagers living near the Hanuman project. Also, the field visit confirmed that the members of the community were consulted and adequately informed prior to the construction activities through the interview and focus group discussion with the village chief, TAO representative and some farmers.	each local village community in the areas surrounding the Hanuman Project as to how grievances can be communicated and submitted during the current phase of the project and how those will be handled.
5	Grievance Redress Mechanism	The Project should establish a mechanism to receive and facilitate resolution of affected people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate and readily accessible.	There is an existing grievance mechanism at the project both for the employees and other stakeholders. The grievance can be sent directly through the grievance form or a letter to the plant manager and it will be evaluated for the corresponding corrective/preventive action. The mechanism also includes the monitoring of the implemented action/s. It is however unclear during the operational stage how else the stakeholders can submit these without assistance from the CR Officer	
6	Monitoring and Reporting	The project should monitor and measure the progress of implementation of the EMP.	The Project submits compliance reports to ERC semiannually during the operation phase of the Project. The Project also reports on other compliance parameters associated with water licenses as detailed in the EMP.	Monitoring and reporting would need to be provided by the Project for Annual Reporting purposes upon ADB investment.

No.	ADB SPS		Status/Issues	Recommendations
	Requirements	Compliance		
				Monitoring Plan shall be enhanced to follow good international industry practice including the World Bank Group Environmental Health and Safety (WBG EHS) Guidelines monitoring protocols, and SPS requirements. Training for the site EHS team on identifying and monitoring birds and bats, other environmental parameters
7	Unanticipated Environmental Impacts	Update the IEE and prepare a new EMP to address unanticipated environmental impacts that becomes apparent during project implementation.	Compliant It is stated in the IEE that the Company is willing to address any unanticipated impacts if ever identified during the field inspection of ERC or other relevant stakeholders.	
8	Biodiversity Conservation and Sustainable Natural Resources Management	The Project should ensure specific requirement and mitigation measures in the development of critical area.	The IEE survey was limited to assess potential long term impacts of the project on the birds and bats in the area.	Conduct additional biodiversity surveys covering the avifauna migration season; (c) implement a bird and bat monitoring program, including monitoring nearby water bodies after completion of the biodiversity survey; and if the proposed survey and monitoring program indicates significant activity or bird or bat strikes; (d) implement measures recommended by bird and bat experts to address the impacts, including, if required, a

No.	ADB SPS		Status/Issues	Recommendations
	Requirements	Compliance		
				shutdown protocol and enhanced collision monitoring program
9	Pollution Prevention and Abatement	The project should apply pollution control technologies and practices consistent international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. The guidelines provide specific measures on the following: (i) pollution prevention, resource conservation, and energy efficiency; (ii) wastes; (iii) hazardous materials; (iv) pesticide use and management; (v) greenhouse gas emissions; (vi) occupational and community health and safety; and (vii) physical and cultural resources.		EMP for the noise and shadow flicker impacts are updated accordingly and implement the EMP for the other parameters according to the existing plan.
10	Greenhouse Gas Emissions	The borrower/client will promote the reduction of project-related anthropogenic GHS emissions in a manner appropriate to the nature and scale of project operations and impacts.	The project is a renewable energy and aims to reduce the greenhouse gas emissions. No significant source of greenhouse gas emissions was identified during the inspections.	
11	Physical Cultural Resources	The borrower/client is responsible for siting and designing the project to avoid significant damage to physical cultural resources.	Not applicable. The project is not located in an area with physical cultural resources	

No.	ADB SPS		Status/Issues	Recommendations
	Requirements	Compliance		
SR-2	To avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring project anddesign alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.	The involuntary resettlement safeguard covers physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas. It covers them whether such losses and involuntary restrictions are full or partial, permanent or temporary.	The project has no involuntary resettlement impacts. All land areas required by the project were obtained through negotiated lease agreement with additional payments to farmers above and beyond regulated requirements and potential baseline farming enterprise. Interviews and discussions with local landholders confirmed their satisfaction with the lease agreements in place and the payment agreements entered into with the Project.	
SR-3	To design and implement projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the Indigenous Peoples themselves so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts, and (iii)	The Indigenous Peoples safeguards are triggered if a project directly or indirectly affects the dignity, human rights, livelihood systems, or culture of Indigenous Peoples or affects the territories or natural or cultural resources that Indigenous Peoples own, use, occupy, or laim as an ancestral domain or asset.	No indigenous peoples were identified or reported in the project area. The IEE identifies Thep Sathip and Bamnet Narong districts, ~250 km northeast of Bangkok. Although the area was founded over two centuries ago during the early Rattanakosin period by Lao people from the north, the majority of the people in the project site identify as Thai. The project area and are in which it is located is reportedly not known to be settled by, claimed by or owned by any distinct or vulnerable ethnic/Indigenous Peoples group.	

No.	ADB SPS		Status/Issues	Recommendations
	Requirements	Compliance		
	can participate actively in projects that affect them.			

4 CONCLUSION

The operation of Hanuman Wind Project is compliant to the national laws and standards and requires some improvement on the environmental management plan and capacity building training on implementing monitoring and reporting to meet ADB's SPS requirements.

The company has committed to adopting best practices to achieve its commitment to environmental and social sustainability and enhance the current environmental and social management with the implementation of the corrective action plan. Table 9 shows the corrective actions and recommendations for the project.

5 CORRECTIVE ACTION PLAN

The following Corrective Action Plan (CAP) has been prepared through the compilation of new CAP items as identified and selected during the course of this assessment.

Table 9: Corrective Action Plan.

Corrective Action	Proposed Timeline		Responsible Party
E&S Management System			
1. E&S Risks It is noted that the Site Environmental Protection Procedure is not aligned with the risks associated with wind farm operation. It is recommended that this be corrected through the expansion of the Site Environmental Protection Procedure to reflect the E&S risks: Environment - Noise - Biodiversity - Shadow flicker Occupational Health and Safety - Working at height - Lifting operations Community Health and Safety - Blade throw - Public access - Abnormal load transportation	Initiated Procedures by December 2019 and complete updated EMP by February 2020	This is expected to be minimal and can be included as part of the project administrative cost.	Site Level EHS Officer
2. Energy Absolute EHS officer at the project level to oversee the compliance of biodiversity, water, noise, shadow flicker. safety and municipal and management waste issues, and attend training courses on related topics, together with ESM staff.	December 2019 and complete all trainings by February 2020		EA Corporate Level Management

3. Site-level staff handling EHS management and ESM staff are to be trained on the proper procedures for monitoring biodiversity, water, noise, shadow flicker, safety, municipal and hazardous waste impacts and assessment of the Project's performance against these parameters. Third party qualified trainers are recommended to conduct training environmental and social monitoring and capacity buildings for the relevant staff.	Initiated Procedures by December 2019 and complete all trainings by February 2020		EA Corporate Level Management
4.Grievance Mechanism It is recommended that the CR Officer place grievance Redress Mechanism instructions and project schedule and action updates in each local village community in the areas surrounding the Hanuman Project as to how grievances can be communicated and submitted during the current phase of the project and how those will be handled. This should be noted and updated in the Environmental Management Plan.	December 2019 and complete updates by February 2020	This is expected to be minimal and can be included as part of the project administrative cost.	Site Level CSR
5.Noise It is noted that the noise survey conducted for the project, while in accordance with Thai regulations and standards appears to have been conducted in wind speeds of 5-8 m/s. The IFC Environmental, Health and Safety Guidelines for Wind Energy require reference for noise monitoring to be assessed as per the following principles: - Receptors should be chosen according to their environmental sensitivity from the modelling results; - Consider monitoring up to wind speed from cut-in speed to 12 m/s. - Noise monitoring in line with IFC General Guidelines of 55 dBa and 45 dBa for residential areas be conducted for the project. This should be noted and updated in the Environmental Management Plan.	Survey to commence by December 2019 and report completed by February 2020	USD 10,000-30,000	Corporate EHS Management to appoint the consultant and site level EHS Officer to oversee implementation of the action item
6.Shadow Flicker It is noted that the simulated shadow flicker model returned results suggesting that there are observation areas are subject to shadow flicker of over 30 minutes per day and 30 hours per year including: HNM5: - Ban Sap Sombun Community (SR03) HNM 8 - Ban Hin Rong Community (SR03) - Ban Wang Sue Community (SR06) HNM 9 - Sombun Sawangtham Temple (SR02)	Survey to commence by December 2019 and report completed by February 2020	USD 4,000-10,000	Corporate EHS Management to appoint the consultant and site level EHS Officer to oversee implementation of the action item

- Ban Non Sa-nga Community (SR03) - Tri Pracha Pattanasuksa School (SR04) - Ban Pradu Ngam community (SR06) - House located in the east of the project It is recommended that shadow flicker monitoring of these sites be undertaken to confirm and define any impacts to sensitive receptors. This monitoring should be undertaken at the sites during the relevant date and time of impacts. This should be noted and updated in the Environmental Management Plan.			
7.<u>Biodiversity – Birds and Bats</u> It is recommended that a bat and bird survey in accordance with good international industry best practice, e.g. SNH Recommended bird survey methods to inform impact assessment of onshore wind farms v2 2017. This would be required to include: - A scoping survey, which must be done to determine the target species for raptor, threatened and migratory bird species survey during migratory and wintering season; - The bird and bat survey design is recommended to be developed in conjunction with design the survey with the Bird Conservation Society of Thailand or University experts, who have the resources, knowledge and capacity to assist with this work; - Additional monitoring after the survey will also need to be undertaken. External expert engagement is recommended on the first monitoring year, and the need to engage the person in the succeeding years will be dependent on the monitoring data and the site staff capacity to execute the biodiversity monitoring activities at that stage of the project. and External expert will assist EA to implement operational measures to address impacts, for example, shutdown protocol, as needed based on the monitoring results This updated information must be updated in the Environmental Management Plan.	Survey to commence during migratory season of soaring birds in 2019 and report completed by February 2020	USD 10,000-40,000	Corporate EHS Management to appoint the Biodiversity consultants

APPENDIX 1

Table : IBAT Search results for birds in the project region.

Bird Name	IUCN Status	Feedback from Director, Sai Thong National Park	Feedback from Bird Conservation Society of Thailand	Feedback from Dr Sakhan, Avifauna Expert from Kasetsart University
Yellow-breasted bunting	CR	Not seen in Park or Project area.	Small species living on farmland may be present in the area. Large flocks of birds together.	Not known to be found in Chaiyaphum. Can be found in Thailand.
White-eyed river martin	CR	Not seen in Thailand for many years.	Last seen in Thailand 39 years ago.	Not known to be found in Chaiyaphum. Last found in Thailand 2015.
White-rumped vulture	CR	Not seen in Park of Project area.	Previously seen in west of Thailand near Myanmar.	Extinct in Thailand
Slender-billed vulture	CR	Historically seen in West of Thailand. Attempts being made to re introduce the species.	Species declared extinct in Thailand.	Not known to be found in Chaiyaphum. Can be found in Thailand
Red-Headed vulture	CR	Last seen 20-30 years ago in Thailand.	Not common in Thailand. Hunters previously known to poison these birds.	Not known to be found in Chaiyaphum. Last found in Thailand in 1992.
White-winged duck	EN	30 years ago reported at Pukio wildlife park.	Not sighted in many years.	Not known to be found in Chaiyaphum. Last found in Thailand in 2018.
Greater adjutant	EN	Occurs in central Thailand swamp areas, no upslopes of project area.	Potential risk of occurrence in project area.	Not known to be found in Chaiyaphum. Last found in Thailand in 2017.

Green peafowl	EN	Not common, attempts made to re introduce to Pukio national park. Not likely to be in projects area.	Not known to be in project area.	Not known to be found in Chaiyaphum. Can be found in Thailand
Black bellied tern	EN	Coastal species, not known in Park or project area.	Mangrove species occurs around gulf of Thailand, unlikely to stop in project area (central to gulf migration away from region in question).	Not known to be found in Chaiyaphum.