



**Biodiversity Risk
Assessment 2023**

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Biodiversity Risk Assessment

1. Introduction

Biodiversity is integral to the existence of all life forms, and companies that have historically used natural resources without fully compensating for the benefits may reveal the unintended consequences of their activities. To guarantee that business activities do not face any severe dependencies or effects on biodiversity, it is essential to employ biodiversity risk assessments to pinpoint and evaluate potential risks.

Energy Absolute (EA) utilizes the World Wildlife Fund's biodiversity risk filter (WWF BRF) to evaluate the potential biodiversity effects of current and future projects or initiatives.

The WWF BRF is created by the World Wildlife Fund (WWF), an international conservation organization supported by 5 million people across over 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

2. Methodology

WWF BRF is designed for identifying and ranking biodiversity risks at both the corporate and portfolio levels. It assists businesses in assessing risks at sites where they operate and where their suppliers are located, and in formulating strategies to address these risks. Additionally, financial institutions can use it to evaluate biodiversity risks associated with the companies in their investment portfolios.

WWF BRF cover physical and reputational biodiversity-related risks that affect locations of company or supply chain sites by considering 1. impacts and dependencies on biodiversity and 2. state of biodiversity in each location.

- **Physical risks** are driven by the ways in which a business and its supply chains depend on and can be affected by both natural and human-induced conditions of land- and seascapes, and how pressures might deteriorate ecosystem services in the future.
- **Reputational risks** can result from a company's actual or perceived negative impacts on biodiversity and people. Reputational risk represents stakeholders' and local communities' perceptions of whether companies conduct business sustainably or responsibly with respect to biodiversity and can ultimately affect brand value and market share, among other factors.

3. Biodiversity Risk Assessment Process¹

EA follows Biodiversity risk assessment process according to WWF Biodiversity Filter Tool (WWF BRF) that comprise with 5 steps 1) scoping & collecting data, 2) assessing risks, 3) implementation, 4) mitigation plan 5) engagement & communication. The steps to assess biodiversity-related risks are demonstrated as following:



3.1 Scoping the Assessment, Collecting location-specific company and supply chain data

This stage involves determining which regions or provinces containing the company's operational facilities will be part of the biodiversity risk evaluation. EA had identified the operation site that would be included in the assessment from EA's operation, adjacent areas to own operations and supply chain (upstream and downstream activities) in total number of 182 sites, cover 1,315 hectares, EA has identified the exact geographical position of the assessed site using its map coordinates (Latitude/Longitude) and has also determined the specific industry sector and its business importance at each site. During the assessment, we categorize our operational facilities, our supply chain (upstream and downstream activities), and any relevant neighboring regions (if applicable) into 3 business importance level (High/medium/low) as follow:

Location	Site Name	Site
Songkhla, Thailand	Hadkanghan Wind Farm Project (HKH)	20
Nakhon Si Thammarat, Thailand	Hadkanghan Wind Farm Project (HKH)	50
Chaiyaphum, Thailand	Hanuman Wind Farm Project (HNM)	108
Lampang, Thailand	EA Solar Lampang (ESL)	1
Phitsanulok, Thailand	EA Solar Phisanulok (ESP)	1
Nakhon Sawan, Thailand	EA Solar Nakornsawan (ESN)	1
Lop Buri, Thailand	EA Solar Lopburi (ESO)	1

¹ WWF Biodiversity Risk Filter (2023). WWF Biodiversity Risk Filter Methodology Documentation, January 2023.

As all sites are in **Electric Energy Production (EEP) - Solar, Wind industry**. Their materiality, including dependencies and impacts, is identified as follow:

Risk Type	Physical Risk																Reputational Risk																	
	1. Provisioning Services				2. Regulating & Supporting Services - Enabling				3. Regulating Services - Mitigating				4. Cultural Services				5. Pressures on Biodiversity				6. Environmental Factors				7. Socioeconomic Factors				8. Additional Reputational Factors					
Risk Category	11	12	13	14	21	22	23	24	25	31	32	33	34	35	36	41	51	52	53	54	61	62	63	64	65	71	72	73	74	81	82	83	84	
Indicator	Water Scarcity	Forest Productivity and Distance to Markets	Limited Flora & Fauna Availability	Limited Marine Fish Availability	Soil Condition	Water Condition	Air Condition	Ecosystem Condition	Pollution	Landslides	Wildfire Hazard	Plant/Forest Pests and Diseases	Herbicide Resistance	Extreme Heat	Tropical Cyclones	Tourism Attractiveness	Land, Freshwater and Sea Use Change	Tree Cover Loss	Invasives	Pollution	Protected/Conserved Areas	Key Biodiversity Areas	Other Important Delineated Areas	Ecosystem Condition	Rangeforities	Indigenous Peoples (IPs): Local Communities (LCs) Lands and Terrestrial	Resource Scarcity: Food/Water/Air	Labor Human Rights	Financial Integrity	Media Scrutiny	Political Situation	Sites of International Interest	Risk Preparation	
BRF Indicators	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Dependency	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Impact
Materiality	3	0	0	0	0	2	2	0	0	0	4	2	0	0	3	4	0	2	1	0	4	4	3	2	2	3	3	0	2	2	2	2	2	2

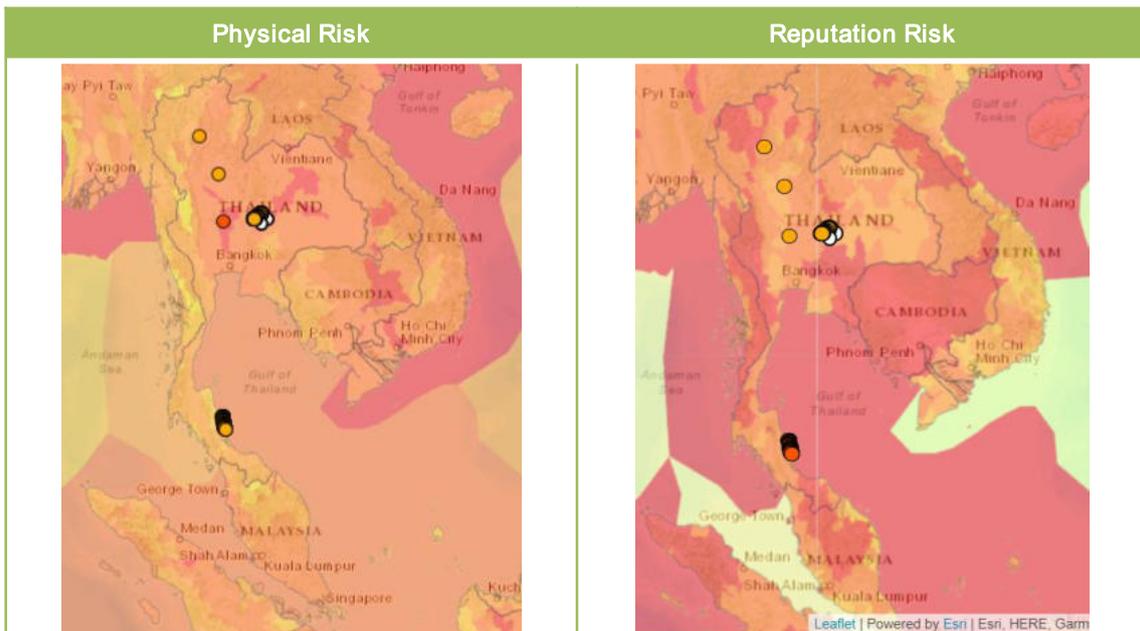
Dependencies and impacts materiality for EEP-Solar,wind industry assessment result from WWF BRF

The result show:

- The dependency indicators that are classified to be high priority.
 - 3.1 Landslides
 - 3.6 Tropical Cyclones
- The impact indicators that are classified to be high priority.
 - 5.4 Pollution
 - 6.1 Protected/Conserved Areas

3.2 Assessing biodiversity-related risks

Identifying biodiversity risks separated by area. It was found that **no area was classified as a very high biodiversity risk level**. The dependency and impact-related biodiversity risks were identified as follows:



WWF Biodiversity Risk Assessment Results :



WWF Biodiversity Risk Assessment Results :

Type	Risk Category	Indicator	No. of Location				
			Very Low	Low	Medium	High	Very High
Physical Risk	1. Provisioning Services	1.1 Water Scarcity					
		1.2 Forest Productivity and Distance to Markets	182.0	0.0	0.0	0.0	0.0
		1.3 Limited Wild Flora & Fauna Availability					
		1.4 Limited Marine Fish Availability					
	2. Regulating & Supporting Services - Enabling	2.1 Soil Condition					
		2.2 Water Condition	0.0	181.0	1.0	0.0	0.0
		2.3 Air Condition					
		2.4 Ecosystem Condition					
		2.5 Pollination					
	3. Regulating Services - Mitigating	3.1 Landslides					
		3.2 Fire Hazard					
		3.3 Plant/Forest/Aquatic Pests and Diseases	0.0	0.0	70.0	112.0	0.0
		3.4 Herbicide Resistance					
		3.5 Extreme Heat					
		3.6 Tropical Cyclones					
	4. Cultural Services	4.1 Tourism Attractiveness	0.0	0.0	0.0	0.0	0.0
	5. Pressures on Biodiversity	5.1 Land, Freshwater and Sea Use Change					
		5.2 Tree Cover Loss	0.0	0.0	181.0	1.0	0.0
		5.3 Invasives					
		5.4 Pollution					
Reputational Risk	6. Environmental Factors	6.1 Protected/Conserved Areas					
		6.2 Key Biodiversity Areas					
		6.3 Other Important Delineated Areas	0.0	1.0	100.0	81.0	0.0
		6.4 Ecosystem Condition					
		6.5 Range Rarity					
	7. Socioeconomic Factors	7.1 Indigenous Peoples (IPs); Local Communities (LCs) Lands and Territories					
		7.2 Resource Scarcity: Food - Water - Air	0.0	181.0	1.0	0.0	0.0
		7.3 Labor/Human Rights					
		7.4 Financial Inequality					
	8. Additional Reputation Factors	8.1 Media Scrutiny					
		8.2 Political Situation	0.0	0.0	182.0	0.0	0.0
		8.3 Sites of International Interest					
		8.4 Risk Preparation					

Priority biodiversity-related risk categories assessment

The result of the assessment throughout EA's value chain will be shown as infographic below. EA group will identify the priority area by selected the risk categories that either of most EA's sites encountered above medium risk level or have at least one site has been assessed as high levels. The result will assist EA to implemented action was made to avoid reduce or mitigate the impacts.

1. Physical risks

■ Regulating services – Mitigating

Background: The occurrence of natural hazards can disturb or disrupt projects, operations, or entire value chains, and can in some cases result in severe damage to or loss of assets. Intact ecosystems can help to mitigate the impact of some natural hazards.

Included Risks: Landslides, wildfire hazard, plant/forest/aquatic pests and diseases, herbicide resistance, and extreme heat.

■ Pressures on Biodiversity

Background: Direct drivers or pressures are drivers that unequivocally influence biodiversity and ecosystem processes. Areas with high pressures on biodiversity are likely to decline in the future, independent of whether the status of biodiversity is intact or already compromised.

Included Risks: Land, freshwater, and sea use change; tree cover loss; invasives and pollution.

2. Reputational risks

■ Environmental Factors

Background: Reputational risk can be driven by negative impacts on local environmental assets and the local prevalence of biodiversity-related issues.

Included Risks: 1) Protected and Conserved Areas, 2) Key Biodiversity Areas, 3) Other Important Delineated Areas 4) Ecosystem Condition, 5) Range Rarity.

■ Additional Reputation Factors

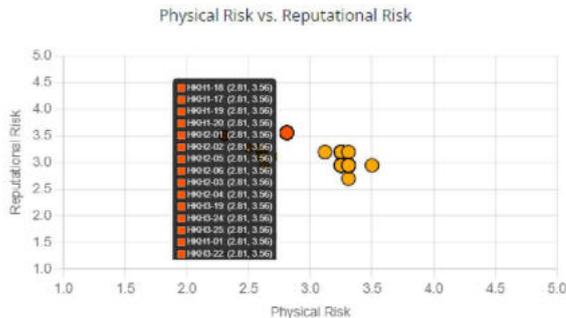
Background: Reputational risk can be driven by the actual or perceived importance or value of ecological assets and socioeconomic conditions and can be aggravated further by the level of public scrutiny on businesses operating in each geography.

Included Risks: 1) Media Scrutiny, 2) Political Situation, 3) Sites of International Interest
4) Risk Preparation.

Site summary

In the site level, the result show that

- **The Hadkanghan Wind Farm Project (HKH)**, located in Nakhon Si Thammarat and Songkhla are only the highest reputational risk.
- **EA Solar Nakornsawan (ESN)** is the only site that has the highest physical risk.
- However, there is **no site has both reputational and physical risk in high or very high level**. Therefore, there is **no site that might create significant biodiversity impact**.



Hadkanghan (HKH) overall assessment result from WWF BRF



Solar Nakornsawan (ESN) overall assessment result from WWF BRF

3.3 Implementation

The result from biodiversity-related risks assessment will be integrated in multi-disciplinary company-wide risk management processes that are comprised of other risk indicators. This integration was made to ensure that priority biodiversity-related risks will be minimized and not affect EA's financial and sustainability performance. The process of integration can be described as steps below.



3.4 Mitigation Plan

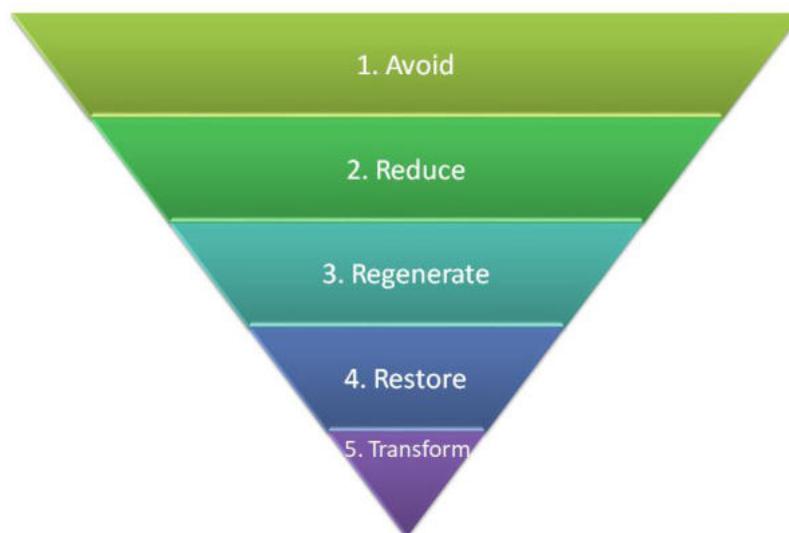
Since there is no site that might create significant biodiversity impact, the mitigation plan includes monitoring and biodiversity value creation plans.

- **Monitoring plan**

Every division within the company, along with their critical suppliers, is responsible for regularly ensuring that their ongoing operations are both productive and have minimal negative effects on various ecosystems. Additionally, we will evaluate performance on a regular basis and provide updates on our progress at least annually in a public report.

- **Biodiversity value creation plan**

If the operational sites are located in areas with very high risk levels, we will implement towards aligning with the biodiversity mitigation hierarchy, which includes avoidance, reduce, restore and offset. Additionally, EA also uses TNFD LEAP guidance as a framework for its biodiversity program to preserve biodiversity value in EA's operational areas. The company prioritizes high-risk areas to implement prevention plans based on the Mitigation Hierarchy principle, as follows:



Action	Definition	Example of EA's Approach or program
1. Avoid	Measures which prevent impact or dependency from happening in the first place; eliminate the impact entirely.	EA had committed in biodiversity commitment that no business units operated in the areas of world heritages and in the protected areas of the International for Conservation of Nature (IUCN), Category I-IV to avoid significant impact to high biodiversity value area.

Action	Definition	Example of EA's Approach or program
2. Reduce	Measures which minimize impacts, but without necessarily eliminating them.	EA has implemented mitigation measures such as designing appropriate distances between wind turbines to reduce potential collisions with birds and bats, and using anti-reflective coating on the turbines to minimize visual disturbances for birds. Additionally, experts regularly monitor the number and species of birds and bats annually.
3. Regenerate	Measures which improve existing processes' biophysical function and productivity of an ecosystem or its components.	EA helped regenerate degraded forests and their ecosystems at Tat Ton National Park, Mueang District, Chaiyaphum Province by planting seasonal trees native to the local forests. Our contribution covers an area of approximately 5,140 acres, including a weir EA built to help store water in a brook, which is a branch of the Chi River.
4. Restore	Measures which initiate or accelerate the recovery of an ecosystem with respect to its health, integrity, and sustainability, with a focus on permanent changes in state.	EA had contributed in "Wet Fire Break" project at Mon Phaya Chae National Park and Khelang Banphot National Park, Lampang Province which faces the problem of wildfire every year. The restoration include creating a forest fire protection line by planting trees with high humidity in the leaves or legumes, creating small holes to create natural fertilizer, promoting the propagation of red ants, butterflies and insects for the fertile ecosystem.
5. Transform	Measures which take actions contributing to system-wide change, notably to alter the drivers of nature loss.	We conduct training on biodiversity issues for our employees to raise awareness, and we carry out reforestation activities with local organizations in order to help restore ecosystems. Additionally, we take actions to address the fundamental drivers of nature loss. We collaborate with our partners and suppliers as part of our commitment and policy, including supporting the government in raising biodiversity policy awareness.

Note:

1. Biodiversity Commitment
https://www.energyabsolute.co.th/pdf/corporate/en/EA_Biodiversity_Commitment_news.pdf
2. No Deforestation Policy
https://www.energyabsolute.co.th/pdf/corporate/en/EANoDeforestation%20Policy_EN.pdf
3. Green Increasing Policy
https://www.energyabsolute.co.th/pdf/corporate/en/IncreasingGreenAreaPolicy_EN.pdf

3.5 Engagement and Communication

In 2023, the company conducted training on bird and bat species identification for employees. Additionally, there is continuous monitoring of the impact mitigation/prevention efforts. We collaborate with experts to monitor bird species and populations, discovering the following rare bird species:

Site	No. species of bird	No. of rare bird*
WTG 45, 47, 48	27	12

Remark: * Painted Stork has been classified as Least Concern (LC).



Hadkanghan Wind Farm (HKH) : Training on bird and bat species identification for wind power plant employees in Nakhon Si Thammarat province.

Additionally, we collaborated with stakeholder (local community) to plant trees, to help restore the ecosystem and provide a sanctuary for wildlife species, as well as increase green spaces and act as a carbon sink or carbon removal. Moreover, EA establish the reforestation project to respond our objective, the main purpose is reforestation approximately 32,000 trees in 197.6 acres (500 rai) by 2037. This helps restore the ecosystem and creates habitats for wildlife, as well as increasing green spaces to absorb carbon dioxide and achieve our goal of being Carbon Neutral and reaching Net Zero.

Green Increasing Policy

https://www.energyabsolute.co.th/pdf/corporate/en/IncreasingGreenAreaPolicy_EN.pdf



EA Solar power plant in Lampang, reforestation activity with local organization in Lampang Province



Wind power plant in Nakhon Si Thammarat (Hadjkanghan Wind Farm), reforestation activity with local organization in Nakhon Si Thammarat