

## PARIS AGREEMENT ALIGNMENT ASSESSMENT

<b>1. General information</b>	
<b>1.1 Name of person that prepared the assessment</b>	Noel Peters, Principal Investment Specialist (Climate Finance), Office of the Director General, Private Sector Operations Department Remife V. De Guzman, Investment Officer (Climate Change), Climate Change, Resilience, and Environment Cluster (CCRE), Climate Change and Sustainable Development Department (CCSD) Eunice Marie L. Ariate-De Vera, Associate Investment Officer (Climate Change), CCRE, CCSD
<b>1.2 Project name</b>	THA: Gulf Solar and Solar with Battery Energy Storage Systems (BESS) Project
<b>1.3 Financing amount</b>	ADB Ordinary Capital Resources (OCR): up to THB10 billion (or its equivalent in United States dollars)
<b>1.4 Finance</b>	Energy
<b>1.5 Economic subsector(s)</b>	Renewable energy generation - solar
<b>1.6 Country, project location</b>	Thailand
<b>1.7 Any other relevant information about the project</b>	Not applicable
<b>1.8 Climate finance</b>	\$279 million from ADB OCR

### 2. Project description

The project will finance and/or reimburse the costs incurred for the development, planning, design, engineering, procurement, construction, installation, testing, commissioning, financing, operation and maintenance of, and all other activities relating to 12 projects comprising 393 megawatts (MW) solar and 256 MW of solar plus 384 MW-hours (MWh) of battery energy storage systems (BESS) projects across Thailand.

### 3. BB1 Assessment

**BB1 UC1: Is the project included in the “universally aligned list” with activities that have a positive or negligible impact on the climate?**

**Response:** Yes.

**Justification:** The project involves “generation of renewable energy from solar” which is in the universally aligned list.

**Result of the BB1 assessment**

*Aligned as per BB1.*

### 4. BB2 Assessment

**BB2 C1: Is the operation at physical climate change risk or does it exacerbate risks in the country?**

**Response:** Yes.

**Justification:** A climate risk assessment resulted in a high-risk rating with the following identified hazards: wildfire and solar radiation change. Medium risks identified are temperature increase, flood, water scarcity.

**BB2 C2: If yes, are appropriate and sufficient actions taken to mitigate the risk?**

The project's draft Corporate Environmental and Social Management System Audit<sup>1</sup> has considered flooding and water scarcity during project screening phase.<sup>2</sup> Thus, identified adaptation options focused on (i) wildfire, (ii) solar radiation change, and (iii) temperature increase. Adaptation measures have been discussed with the borrower who has committed to the following achievable recommendations.

***Adaptation actions to mitigate impacts from wildfire***

1. Selected location is within an industrial area, surrounded by agricultural lands, away from the wild and forested areas.
2. Develop and implement wildfire risk management procedures.
3. Design to implement a 10-meter buffer zone between the project site boundary and the photovoltaic (PV) module area.
4. Enhance vegetation control in the vicinity of the solar PV plant, BESS, and substation.
5. Develop fire response plans and tools, including building community partnerships and improving communication with fire agencies to better respond to wildfires.
6. Implement emergency access and response plans in case of nearby wildfires.
7. Implement fire management plan, test systems, and continue implementation of fire response and evacuation drills.
8. Maintain comprehensive communication system to ensure workers are aware of conditions, protect worker safety.
9. Implement clear communication around post-disaster recovery and returning to work.

***Adaptation actions to mitigate impacts from solar radiation***

10. Select PV modules and inverters that are optimized for performance given Thailand's high solar radiation and ambient temperatures.
11. Use an underground cabling system to maximize reliability and protection from elements.
12. Where practicable, assets will be stored in cool and shaded areas.
13. Ensure safety measures are taken to protect personnel from increased solar radiation (e.g., sunscreen, hats, long sleeves & trousers, sunglasses).
14. Include water stations and encourage breaks during the workday.
15. Provide shaded areas for breaks.

***Adaptation actions to mitigate impacts from temperature increase***

16. Select PV module and PV inverter to operate in higher solar radiation and ambient temperature to withstand existing condition in Thailand.
17. Position the BESS separate from the PV modules, in adherence to safety regulations.
18. Conduct an engineering analysis to determine the capacity and type of a dedicated cooling system for the BESS.
19. Place fire extinguishers at strategic locations within the covered power plant for immediate response.
20. Install more than one set of monitoring system for each string inverter and weather stations in the power plant.
21. Ensure sufficient water (and drinking water) is stored safely onsite in case additional is required during heatwaves.
22. Update personnel guidance manuals and training to reflect best safety practices for work during heatwaves.
23. Include water stations and regular breaks in the workday with extra breaks during heat events.
24. Construct resting areas with adequate ventilation at optimum temperature. Erect temporary shade at all work fronts for all workers.

**BB2 C3: Is the operation inconsistent with relevant national adaptation policies/strategies?**

<sup>1</sup> Project study conducted in five pilot sites only: (1) Sa Long Ruea Subdistrict, Huai Krachao District, Kanchanaburi Province; (2) Moo 8, Nong Krathum Sub-district, Doem Bang Nang Buat District, Suphanburi Province; (3) Sa Long Ruea Subdistrict, Huai Krachao District, Kanchanaburi Province; (4) Nikhom Songkhro Subdistrict and Khok Sa-at Subdistrict, Mueang Udon Thani District, Udon Thani Province; (5) Na Kha Subdistrict, Mueang Udon Thani District, Udon Thani Province.

<sup>2</sup> Gulf Energy Development Public Company Limited. 2023. Draft Corporate Environmental and Social Management System Audit. Bangkok, Thailand.

**Response:** No.

**Justification:** Thailand's National Adaptation Plan focuses on six sectors: water resources management, agriculture and food security, tourism, public health, natural resources management, and human settlements and security. The renewable energy project is not an impediment to Thailand's achievement of its adaptation plans; thus, the operation is not inconsistent with the relevant national adaptation policies of Thailand.

[Thailand Updated NDC.pdf \(unfccc.int\)](#)

[The First Draft of Thailand National Adaptation Plan | UNDP Climate Change Adaptation \(adaptation-undp.org\)](#)

**Result of the BB2 assessment**

*Aligned as per BB2.*

**5. Paris Agreement Alignment assessment result**

*Aligned with the Paris Agreement.*

**6. Climate finance.** \$279 million from ADB OCR. Based on the Guidance Note on Counting Climate Finance at ADB: An Update, the project is eligible for climate mitigation finance as a renewable energy—solar project, which promotes efforts to limit or reduce greenhouse gas (GHG) emissions. The project is expected to generate an average of 1,465 gigawatt-hour (GWh) of electricity from solar energy between 2026 to 2049, reducing GHG emissions by an average of 605,466 tons of carbon dioxide (tCO<sub>2</sub>) annually.

**7. Greenhouse gas emission reduction calculations.** Greenhouse gas emissions reduction was estimated using the Guidelines for Estimating Greenhouse Gas Emissions of Asian Development Bank. Electricity generation and GHG emissions reduction were estimated based on the assumptions and equations below.

Annual greenhouse gas emissions reduction	
ER = BE – PE	
BE	baseline emission in tCO <sub>2</sub> per year (tCO <sub>2</sub> /y)
PE	project emission in tCO <sub>2</sub> /y
ER	annual emissions reduction in tCO <sub>2</sub> /y
Baseline emission	
BE = EG x EF <sub>grid</sub>	
EG	average annual electricity generation by the RE project, MWh/year
EG	1,465,756 MWh
EF <sub>grid</sub>	combined emission factor for the THA grid, tCO <sub>2</sub> /kWh <sup>3</sup>
EF <sub>grid</sub>	0.413074 tCO <sub>2</sub> /MWh
BE	605,466 tCO <sub>2</sub> /y
PE	0
ER	605,466 tCO <sub>2</sub> /y

<sup>3</sup> International Financial Institutions Technical Working Group on Greenhouse Gas Accounting. 2022. [Harmonized IFI Default Grid Factors 2021 v3.2 | UNFCCC](#).