

VCS Project Description Template

This template is for the design of projects using the VCS Program.

Instructions for completing the project description

**FILE NAME**: Use the following format for the file name of the completed document:

* For projects requesting pipeline listing: VCS PD DRAFT ProjectID DDMMMYYYY
* For projects requesting registration approval: VCS PD ProjectID DDMMMYYYY

‘DDMMMYYYY’ should be the original date of issue as reported on the title page. If revised documents are submitted, add ‘track’ to the end of the file name and update DDMMMYYYY to the most recent date of issue.

**FILE TYPE**: Submit the document as a non-editable PDF.

**TITLE PAGE FORMATTING:** This document may feature the project title and project proponent’s or preparers’ logo using size 24, regular (non-italic) Century Gothic font. Fill in and complete each row of the table using size 10.5, black, regular (non-italic) Arial or Franklin Gothic Book font.

**GENERAL FORMATTING**: Complete all sections using size 10.5, black, regular (non-italic) Arial or Franklin Gothic Book font.

**GENERAL INSTRUCTIONS:** Specific instructions for completing each section of the project description template are located under the section headings in this template. Instructions relate back to the rules and requirements set out in the *VCS Standard* and accompanying VCS Program documents. The preparer will need to refer to these documents to complete the template.

Note: The instructions in this template are to serve as a guide and do not necessarily represent an exhaustive list of the information the preparer must provide under each section of the template.

Where a section is not applicable, explain why the section is not applicable (i.e., do not delete the section from the final document and do not only write “not applicable”).

Delete all instructions, including this introductory text, from the final document.



Project TITLE

Logo (optional)

|  |  |
| --- | --- |
| Project title | *Name of the project* |
| **Project ID** | *Verra Project ID* |
| **Crediting period** | *DD-Month-YYYY to DD-Month-YYYY* |
| Original date of issue | *For pipeline listing, DD-Month-YYYY is the date of submission*  *For registration, DD-Month-YYYY is the date the project description was completed following the completion of the audit* |
| Most recent date of issue | *DD-Month-YYYY is the date on which the document was most recently submitted* |
| Version | *Version number of this document* |
| *VCS Standard* Version | *Version number of the* VCS Standard *used by the project* |
| Prepared by | *Individual and organization that prepared this document* |

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# Project Details

## Summary Description of the Project

SECTION\_COMPLETE

Summary Description of the Project

The Prime Road National Solar Park Project involves the development, construction, and operation of a 60-megawatt alternating current (MWac) solar photovoltaic (PV) power plant. The plant will install 78 MW-peak of direct current (DC) solar photovoltaic capacity utilizing 164,248 monocrystalline bifacial PV modules, each with a 475Wp rating, and a single-axis tracking mounting system. The plant infrastructure includes 20 subsystems, each with a 3150kVA Box \u2013 Transformer and a total of 343 sets of 175kW string inverters. Weather stations, a lightning protection system, and internal drainage systems with retention ponds will also be constructed.

The project is located in Kampong Chhnang Province, Cambodia, specifically in Kbal Toeuk commune, Toeuk Phos district. The site is approximately 60-70 kilometers from the capital, Phnom Penh.

The project is expected to generate GHG emission reductions by enabling a transition to clean solar energy sources. This will limit Cambodia's dependence on imported coal and other fossil fuels, delay or defer the construction of new coal-fired plants, and reduce reliance on hydropower generation. By substituting fossil fuel and hydropower-based generation with solar power, the project will contribute to national emission reduction targets and mitigate pollution impacts.

Prior to the project's implementation, Cambodia's power supply relied heavily on a mix of hydropower (48%), coal (24%), diesel, and imports from neighboring countries. The country's energy sector faced challenges related to energy security, affordability, and environmental sustainability. In 2017, Cambodia's energy consumption was 8,073 GWh, with a significant portion derived from fossil fuels. Approximately 5 million Cambodians lacked access to electricity, depending on traditional fuels. The baseline scenario anticipated an increase in greenhouse gas emissions due to continued reliance on fossil fuel-based energy generation.

The project is estimated to achieve annual average greenhouse gas reductions of 110,700 tons of carbon dioxide per annum. For a lifetime, the project will contribute to the reduction of emissions up to 1,760,000 tCO2e.

## Audit History

SECTION\_ATTEMPTED

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Audit type | Period | Program | Validation/verification body name | Number of years |
| Validation/verification (ESIA) | March 2021 | Environmental and Social Safeguards (ADB, IFC, JICA, Cambodian EIA) | ADB, IFC, Ministry of Environment (MoE) | INFO\_NOT\_FOUND: Number of years |
| Monitoring Report | Bi-monthly (during peak construction) | ADB/IFC Lending Requirements | ADB, IFC | INFO\_NOT\_FOUND: Number of years |
| Monitoring Report | Quarterly (during construction) | NSP EDC's PIC Requirements | NSP EDC's PIC | INFO\_NOT\_FOUND: Number of years |
| Monitoring Report | Six-month (during construction) | Cambodian EIA Requirements | Ministry of Environment (MoE) | INFO\_NOT\_FOUND: Number of years |
| Monitoring Report | Annual (during operation) | ADB/IFC Lending Requirements | ADB, IFC | One year |
| Monitoring Report | Annual (during operation) | NSP EDC's PIC Requirements | NSP EDC's PIC | One year |
| Monitoring Report | Annual (during operation) | Cambodian EIA Requirements | Ministry of Environment (MoE) | One year |

## Sectoral Scope and Project Type

SECTION\_ATTEMPTED

```  
Sectoral Scope and Project Type

|  |  |
| --- | --- |
| Sectoral scope | Energy |
| Project activity type | Renewable energy generation - solar |

Complete the table below with information relevant for AFOLU projects:

|  |  |
| --- | --- |
| Sectoral scope | INFO\_NOT\_FOUND: Sectoral scope |
| AFOLU project category | INFO\_NOT\_FOUND: AFOLU project category |
| Project activity type | INFO\_NOT\_FOUND: Project activity type |
| ``` |  |

## Project Eligibility

SECTION\_COMPLETE

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## Project Design

SECTION\_ATTEMPTED

Single location or installation

Grouped project design  
INFO\_NOT\_FOUND: Grouped project design information.

## Project Proponent

SECTION\_ATTEMPTED

|  |  |
| --- | --- |
| Organization name | Prime Road Alternative (Cambodia) Company Limited |
| Contact person | INFO\_NOT\_FOUND: Contact person |
| Title | INFO\_NOT\_FOUND: Title |
| Address | INFO\_NOT\_FOUND: Address |
| Telephone | INFO\_NOT\_FOUND: Telephone |
| Email | INFO\_NOT\_FOUND: The email address domain must match that of the organization. |

## Other Entities Involved in the Project

SECTION\_COMPLETE

An error occurred while asking Gemini: 429 You exceeded your current quota, please check your plan and billing details. For more information on this error, head to: https://ai.google.dev/gemini-api/docs/rate-limits. [violations {  
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## Ownership

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## Project Start Date

SECTION\_COMPLETE

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## Project Crediting Period

SECTION\_COMPLETE

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## Project Scale and Estimated GHG Emission Reductions or Removals

SECTION\_ATTEMPTED

Project Scale and Estimated GHG Emission Reductions or Removals

< 300,000 tCO2e/year (project)

|  |  |
| --- | --- |
| Calendar year of crediting period | Estimated GHG emission reductions or removals (tCO2e) |
| 29-June-2022 to 31-December-2022 | INFO\_NOT\_FOUND: Estimated GHG emission reductions or removals (tCO2e) |
| 01-January-2023 to 31-December-2023 | INFO\_NOT\_FOUND: Estimated GHG emission reductions or removals (tCO2e) |
| 01-January-2024 to 31-December-2024 | INFO\_NOT\_FOUND: Estimated GHG emission reductions or removals (tCO2e) |
| ... | INFO\_NOT\_FOUND: Estimated GHG emission reductions or removals (tCO2e) |
| 01-January-2041 to 31-December-2041 | INFO\_NOT\_FOUND: Estimated GHG emission reductions or removals (tCO2e) |
| 01-January-2042 to 28-June-2042 | INFO\_NOT\_FOUND: Estimated GHG emission reductions or removals (tCO2e) |
| Total estimated ERRs during the first or fixed crediting period | INFO\_NOT\_FOUND: Total estimated ERRs during the first or fixed crediting period |
| Total number of years | 20 |
| Average annual ERRs | INFO\_NOT\_FOUND: Average annual ERRs |

## Description of the Project Activity

SECTION\_ATTEMPTED

## Project Location

SECTION\_COMPLETE

## Conditions Prior to Project Initiation

SECTION\_COMPLETE

## Compliance with Laws, Statutes and Other Regulatory Frameworks

SECTION\_COMPLETE

## Double Counting and Participation under Other GHG Programs

### SECTION\_ATTEMPTED

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?  
INFO\_NOT\_FOUND: Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?  
If yes, provide required evidence of no double issuance as outlined by the VCS Standard.  
INFO\_NOT\_FOUND: required evidence of no double issuance as outlined by the VCS Standard  
Has the project registered under any other GHG programs?  
INFO\_NOT\_FOUND: Has the project registered under any other GHG programs?  
If yes, provide the registration number and the date of project inactivity under the other GHG program.  
INFO\_NOT\_FOUND: registration number and the date of project inactivity under the other GHG program  
Is the project active under the other program?  
INFO\_NOT\_FOUND: Is the project active under the other program?  
Has the project been rejected by any other GHG programs?  
INFO\_NOT\_FOUND: Has the project been rejected by any other GHG programs?  
If yes, provide the program name(s), reason(s) and date for the rejection, justification of eligibility under the VCS Program, and any other relevant information.  
INFO\_NOT\_FOUND: program name(s), reason(s) and date for the rejection, justification of eligibility under the VCS Program, and any other relevant information

## Double Claiming, Other Forms of Credit, and Scope 3 Emissions

### SECTION\_ATTEMPTED

Double Claiming with Emissions Trading Programs or Binding Emission Limits

## Sustainable Development Contributions

SECTION\_COMPLETE

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]

## Additional Information Relevant to the Project

### SECTION\_ATTEMPTED

Leakage Management  
INFO\_NOT\_FOUND: The provided documents do not describe a leakage management plan for GHG emissions. The term "leakage" appears in the context of material leaching from PV panels and potential spills/contamination of water, for which mitigation measures are described.

## Stakeholder Engagement and Consultation

SECTION\_ATTEMPTED

## Risks to Stakeholders and the Environment

SECTION\_COMPLETE

## Respect for Human Rights and Equity

SECTION\_ATTEMPTED

Respect for Human Rights and Equity

Labor and Work

| | Risks identified | Mitigation or preventative measure(s) taken |  
| --- | --- | --- |  
| Discrimination | Gender disparities in employment and women's limited livelihood alternatives due to traditional attitudes, low literacy and education levels, and male-dominated technical/managerial roles in the energy sector. Risk of inequitable employment, training, and procurement opportunities. | Increasing gender inclusiveness in procurement, taking on female interns in technical roles, implementing an anti-sexual harassment policy, and delivering a community project that caters to women’s needs. Sub-contractor's Local Recruitment and Training Plan to include special opportunities for women and women groups. Develop a preferential local recruitment, training, and procurement plans and procedures. Awareness training on ADB/IFC and Cambodia labor standards. |  
| Sexual harassment | Potential for sexual exploitation and harassment among workers and community members. | Implementing an anti-sexual harassment policy. Enforce the workers' code of conduct to avoid conflicts, and prevent sexual exploitation and harassment among workers and community members. Create awareness of sexually-transmitted diseases (HIV/AIDs). |  
| Equal pay for equal work | INFO\_NOT\_FOUND: equal pay for equal work risks | INFO\_NOT\_FOUND: equal pay for equal work mitigation measures |  
| Gender equity in labor and work | Extensive gender disparities in employment, primarily because of traditional attitudes about "appropriate" occupations for women and men. Low literacy and education levels of women in the workforce limit their livelihood alternatives and bar them from higher-level occupations and decision-making positions. Public-sector energy roles tend to be male-dominated, with women typically employed in finance and accounting functions. | Increasing gender inclusiveness in procurement, taking on female interns in technical roles, implementing an anti-sexual harassment policy, and delivering a community project that caters to women’s needs. Sub-contractor's Local Recruitment and Training Plan to include special opportunities for women and women groups. Maximize the potential use of local workers by contractors during construction and operation. |  
| Forced labor | Potential for bonded labor or forced labor among project workers. | Compliance with national labor laws and internationally recognized core labor standards (pursuant to ADB’s Social Protection Strategy). Create awareness of sexually-transmitted diseases (HIV/AIDs), child labor, bonded labor or forced labor among project staff and workers. |  
| Child labor | Potential for child labor among project workers. | Compliance with national labor laws and internationally recognized core labor standards (pursuant to ADB’s Social Protection Strategy). Create awareness of sexually-transmitted diseases (HIV/AIDs), child labor, bonded labor or forced labor among project staff and workers. |  
| Human trafficking | Increase in human trafficking as a social issue/risk to be considered in project design. | Enforce the workers' code of conduct to avoid conflicts, and prevent sexual exploitation and harassment among workers and community members. Create awareness of sexually-transmitted diseases (HIV/AIDs), child labor, bonded labor or forced labor. |

Human Rights

| Risks identified | Mitigation or preventative measure(s) taken |  
| --- | --- |  
| No risk identified | No distinct and vulnerable indigenous people groups were identified in the area. No specific risks related to recognizing, respecting, and promoting the protection of the rights of IPs, LCs, and customary rights holders in line with applicable international human rights law, and the United Nations Declaration on the Rights of Indigenous Peoples and ILO Convention 169 on Indigenous and Tribal Peoples were identified. |

Indigenous Peoples and Cultural Heritage

| Risks identified | Mitigation(s) or preventative measure taken |  
| --- | --- |  
| Potential for moderate temporary air quality impacts (fugitive dust generation, noise) to existing Physical Cultural Resources (PCRs) during construction activities. Potential to disturb as yet unknown PCRs during site preparation and civil works. | Mitigation of air quality and noise impacts as per established plans. Conducting consultations to avoid sensitive religious and spiritual functions/periods. Implementation of Chance Find Procedures for unknown PCRs. In case of chance find of cultural property during construction, work should be stopped and reported to local police, who shall transmit it to the Provincial Governor without delay. |

Property Rights

| Risks identified | Mitigation or preventative measure(s) taken |  
| --- | --- |  
| \*\*For the 60MW solar plant site:\*\* No involuntary land acquisition resulting in physical and economic displacement; land was purchased on a willing-buyer willing-seller basis. <br><br>\*\*For shared facilities (transmission line and access road for the National Solar Park Project, which the 60MW solar plant is part of):\*\* Involuntary displacement impacts anticipated during construction of the dedicated 40-kilometer transmission line. The access road is cutting through private land and plantation. | \*\*For the 60MW solar plant site:\*\* Land acquired did not adversely impact the business or livelihoods of sellers; landowners were not identified as vulnerable or having land-based livelihoods. Land was acquired on a willing-buyer willing-seller basis at market rates, with contracts and agreements prior to payment, and verified by an external independent expert as free, fair, transparent, and causing no involuntary displacement. <br><br>\*\*For shared facilities:\*\* A resettlement plan has been prepared in accordance with ADB Safeguard Policy Statement requirements, and its implementation will be monitored by ADB’s sovereign operations department. Prior to placing transmission poles, EDC will complete compensation with informed consent from affected households. All concerns and impacts will be addressed in the Resettlement Action Plan of EDC’s National Solar Park. Similar treatment for the access road, with associated impacts recorded and addressed prior to construction. The Law on Land (2001) ensures that ownership deprivation for public interest is carried out according to legal forms and procedures after advanced payment of fair and just compensation. |

Benefit Sharing

| Process used to design the benefit sharing plan | Describe the benefit-sharing agreement. Where affected stakeholder groups wish to keep elements of the plan private, provide the full arrangement as a commercially sensitive document. The project proponent shall demonstrate that the community wishes to keep this information private. | Approval and dissemination of benefit sharing plan |  
| --- | --- | --- |  
| The borrower indicated in its project proposal its plans to provide financial support for local community development activities. Cambodian regulation requires contributions to environmental and social funds. | The project's benefit sharing includes: <ul><li>Provision of employment opportunities for local community members.</li><li>Financial support for local community development activities.</li><li>Contribution of $500 per year to an Environmental Fund.</li><li>Contribution of $500 per year to a Social Fund.</li><li>The total fund contributed by the project over 20 years is $20,000.</li></ul> | INFO\_NOT\_FOUND: approval and dissemination of benefit sharing plan |

## Ecosystem Health

SECTION\_ATTEMPTED

Ecosystem Health

| | Risks identified | Mitigation or preventative measure(s) taken |  
| --- | --- | --- |  
| Impacts on biodiversity and ecosystems | 1. Loss of a proportion of priority fauna habitat during construction, localized to the approximately 97 ha of modified habitat to be removed. <br> 2. Potential 'lake effect' from PV panels during operation, attracting birds that mistake panels for water bodies, potentially leading to injury or death. | 1. Design plant layout to avoid most sensitive habitats and maintain buffer zones. <br> 2. Undertake habitat clearance in a progressive and sensitive manner to enable priority fauna to move away and avoid isolating fauna in fragmented areas. <br> 3. Provide adequate ground clearance under fencing for passage of animals/wild species to prevent habitat fragmentation. <br> 4. Maintain hedges and field margins. <br> 5. Install wind-driven bird deterrents (scarers) or use audible bird deterrents to keep birds away from solar panels. |  
| Soil degradation and soil erosion | 1. Surface erosion due to land leveling, grading, vegetation clearance, and heavy rainfall events. <br> 2. Soil compaction from heavy traffic passage and construction activities. <br> 3. Soil contamination from accidental leaks/spills of hydrocarbons, oil, grease, chemicals, and sewage/wastewater effluent. | 1. Implement engineering and biological measures (e.g., silt traps, soil-binding grass) to prevent surface erosion. <br> 2. Restore loose soil from foundations through ramming. <br> 3. Recover topsoil stripped from clearing and construction activities for progressive and final rehabilitation. <br> 4. Limit land clearing to the immediate project site. <br> 5. Restrict activities involving chemicals or hydrocarbons to designated areas with appropriate bunding and impermeable bases. <br> 6. Provide appropriate sanitation systems for waste and sewage collection and disposal. <br> 7. Implement strict controls on the use of sanitation facilities through education and enforcement. |  
| Water consumption and stress | 1. Increased groundwater withdrawal (if boreholes are used) potentially affecting existing household boreholes, especially during the dry season when groundwater levels are lower. <br> 2. Less water availability for PV panel cleaning and vegetation maintenance during drought episodes. <br> 3. Contamination of surface and groundwater from accidental spills/leakage of chemicals such as diesel, grease, and oil, or from wastewater effluent. | 1. Source water for construction and operation from local water service providers (tanked water from Anlong Chrey dam/reservoir) to avoid groundwater extraction. <br> 2. Conduct a detailed assessment prior to any future groundwater extraction to confirm impacts and comply with regulations. <br> 3. Avoid groundwater abstraction. <br> 4. Collect and reuse stormwater during the wet season for construction and maintenance periods, storing it in existing modified ponds. <br> 5. Handle, store, and use all chemicals and hydrocarbons in designated areas with adequate bunding, hardstand preparation, inspection, auditing, and contingency measures. <br> 6. Install septic tanks to contain wastewater from toilets and kitchens, located at least 100 m from any water sources. <br> 7. Prohibit the use of chemicals/detergents for cleaning PV panels. |

Rare, Threatened, and Endangered Species

Is the project located in or adjacent to habitats for rare, threatened, or endangered species?

Yes

If yes, list such species and habitats in the table below and provide evidence that the project will not adversely impact these areas.

| Species and habitat | Demonstrate that the project will not adversely impact habitats and areas needed for habitat connectivity for rare, threatened, or endangered species. |  
| --- | --- |  
| \*\*Birds:\*\*<br> - Green Peafowl (Endangered)<br> - Blossom-headed Parakeet (Near-Threatened)<br> - Red-breasted Parakeet (Near-Threatened)<br> - Cambodian Tailorbird (Near-Threatened)<br> - Oriental Darter (Near-Threatened)<br> - Migratory bird species (e.g., Lesser Whistling Duck, Cotton Pygmy Goose, Barn Swallow, Asian Palm Swift, House Swift)<br> <br> \*\*Bats:\*\*<br> - Hipposideros cf. griffini (Proposed Near-Threatened)<br> - Pteropus vampyrus (Near-Threatened)<br> - P. lylei (Vulnerable)<br> <br> \*\*Reptiles:\*\*<br> - Indochinese Spitting Cobra (Vulnerable)<br> - King Cobra (Vulnerable)<br> <br> \*\*Fish:\*\*<br> - Thickliped Barb - Probarbus labeamajor (Endangered)<br> <br> \*\*Habitats:\*\*<br> - An Long Chrey Reservoir (4-5 km downstream of site)<br> - Tbeng Srorng Community Forest (300 ha, 5-7 km northeast of site)<br> - Natural streams within the 60 MW solar plant site (feeding grounds for some bird species, e.g., Green Peafowl)<br> - Modified scrubland/paddy fields within the 60 MW solar plant site (wide habitat tolerance for some small mammals/reptiles) | - The 60 MW solar plant site is a modified environment (disturbed by human activity, formerly cassava plantations, now scrubland/paddy fields), and no critical habitats were found directly on site. Construction impacts on terrestrial flora and fauna within the site will be negligible.<br> - \*\*For Birds:\*\* <br> &nbsp;&nbsp;- Minimal impact on national populations of Near-Threatened Blossom-headed Parakeet and Red-breasted Parakeet as their primary habitats are in Northern Cambodia. <br> &nbsp;&nbsp;- Oriental Darter is only a non-breeding visitor to the site. <br> &nbsp;&nbsp;- Natural streams within the site serve as feeding grounds for Green Peafowl, while its breeding grounds are in the Tbeng Srorng community forest.<br> &nbsp;&nbsp;- PRAC will install wind-driven or audible bird deterrents to reduce the risk of 'lake effect' and bird crashes into solar panels during operation.<br> - \*\*For Bats:\*\* Current data suggests the subproject area does not qualify as critical habitat under IFC Performance Standard 6 criteria.<br> - \*\*For Reptiles & Mammals:\*\* Tbeng Srorng community forest, where vulnerable species have been reported, is 5-7 km away and will not be affected by the project. Field surveys did not identify these species or suitable habitats directly on the project site. Construction impacts will be localized, and priority fauna are likely to move into similar habitats elsewhere.<br> - \*\*For Fish:\*\* The endangered Thickliped Barb is in An Long Chrey reservoir (4-5 km away). The project design minimizes potential impacts to aquatic habitat by minimizing the construction footprint and avoiding local wetlands/waterways.<br> - \*\*For Habitat Connectivity:\*\* <br> &nbsp;&nbsp;- A buffer zone of 100 m will be maintained around watercourses (e.g., Praek Mkak) to retain riparian habitats and functionality. <br> &nbsp;&nbsp;- Provision for adequate ground clearance under perimeter fencing will be made to allow passage of animals/wild species and prevent habitat fragmentation. <br> &nbsp;&nbsp;- Hedges and field margins will be maintained/planted along the perimeter.<br> &nbsp;&nbsp;- Personnel and contractors are prohibited from fishing and trading in aquatic natural resources. |  
| Areas needed for habitat connectivity | Provision for adequate ground clearance under perimeter fencing for allowing passage of animals/wild species to prevent habitat fragmentation. Maintain hedges and trees at field margins. The project will design a plant layout to avoid most sensitive habitats including maintaining the buffer zone to keep habitats as possible. |

| | Risks identified | Mitigation or preventative measure(s) taken |  
| --- | --- | --- |  
| Habitats for rare, threatened, and endangered species | 1. Loss of localized habitat within the 97 ha project footprint during construction, affecting priority fauna with wide habitat tolerance (e.g., small mammals, reptiles, and some bird species).<br>2. Potential for 'lake effect' from PV panels during operation, attracting birds that mistake panels for water bodies, leading to injury or death. <br>3. Direct and indirect impacts to areas of biodiversity sensitivity (e.g., Praek Mkak stream and its connection to An Long Chrey Reservoir which contains endangered fish species). | 1. Design plant layout to avoid most sensitive habitats and maintain buffer zones. <br>2. Undertake habitat clearance in a progressive and sensitive manner to allow fauna to move away from work areas and avoid isolation in fragmented habitats. <br>3. Raise awareness among workforce and local villagers about protecting forest resources and conservation-important species. <br>4. Install wind-driven or audible bird deterrents to keep birds away from solar panels. <br>5. Minimize project construction footprint to avoid local wetlands and waterways, primarily draining into Praek Mkak. <br>6. Retain riparian habitats with a 100 m buffer zone around watercourses (e.g., Praek Mkak). <br>7. Prohibit personnel and contractors from fishing and trading in aquatic natural resources. |  
| Areas for habitat connectivity | Habitat fragmentation or obstruction of wildlife movement due to fencing around the solar plant site. | 1. Provide adequate ground clearance under perimeter fencing to allow for the passage of animals/wild species. <br>2. Maintain existing hedges and field margins along the solar plant perimeter to support local biodiversity and minimize visual impacts. |

Introduction of Species

| Species introduced | Classification | Justification for use | Adverse effects and mitigation |  
| --- | --- | --- | --- |  
| Native plant species (soil binding grass) | Native | To stabilize the soil and restore habitat. | INFO\_NOT\_FOUND: <information> |  
| INFO\_NOT\_FOUND: <species introduced> | INFO\_NOT\_FOUND: <classification> | INFO\_NOT\_FOUND: <justification for use> | INFO\_NOT\_FOUND: <adverse effects and mitigation> |  
| INFO\_NOT\_FOUND: <species introduced> | INFO\_NOT\_FOUND: <classification> | INFO\_NOT\_FOUND: <justification for use> | INFO\_NOT\_FOUND: <adverse effects and mitigation> |

Where invasive species exist in the project area, list such species in the table below and describe the commensurate mitigation measure(s) in place to prevent the spread or continued existence of invasive species.

| Existing invasive species | Mitigation measures to prevent the spread or continued existence of invasive species |  
| --- | --- |  
| INFO\_NOT\_FOUND: <existing invasive species> | INFO\_NOT\_FOUND: <mitigation measures to prevent the spread or continued existence of invasive species> |  
| INFO\_NOT\_FOUND: <existing invasive species> | INFO\_NOT\_FOUND: <mitigation measures to prevent the spread or continued existence of invasive species> |  
| INFO\_NOT\_FOUND: <existing invasive species> | INFO\_NOT\_FOUND: <mitigation measures to prevent the spread or continued existence of invasive species> |

Use the table below to identify and summarize any risks related to invasive species. Describe the commensurate mitigation or preventative measure(s) in place to prevent or mitigate the risk. Where no risk is identified, write "No risk identified” in the first column, and provide justification in the second column. Add rows as needed.

| | Risks identified | Mitigation or preventative measure(s) taken |  
| --- | --- | --- |  
| Invasive species | No risk identified | The environmental assessment does not mention the presence of existing invasive species in the project area. The project commits to using native plant species for re-seeding and prohibits the use of herbicides/pesticides for vegetation clearing. |

Ecosystem Conversion

ARR, ALM, WRC or ACoGS projects shall provide evidence that the project area was not cleared or drained of existing natural ecosystems, unless such clearing took place at least 10 years prior, or the dominant land cover was invasive.

Evidence: The 97 ha project site was formerly used for commercial cassava plantations and is described as degraded scrubland and paddy fields, disturbed by human activity. The area has been "long modified" and no critical habitats are found within the site. This indicates that any significant clearing or draining of natural ecosystems took place prior to the project's inception, and the current land cover is an already modified environment, not intact natural ecosystems.

Use the table below to identify and summarize any risks related to ecosystem conversion. Describe the commensurate mitigation or preventative measure(s) in place to prevent or mitigate the risk. Where no risk is identified, write "No risk identified” in the first column, and provide justification in the second column. Add rows as needed.

| | Risks identified | Mitigation or preventative measure(s) taken |  
| --- | --- | --- |  
| Ecosystem conversion | 1. Negative impact on land use and habitat (flora) loss due to the conversion of degraded scrubland/paddy fields to a solar plant. While the site is already modified, some level of ecosystem conversion is inherent to the project.<br>2. Changes to the physical landscape. | 1. Minimize adverse physical impacts to the surrounding landscape by minimizing the project footprint and blending major project components with the surroundings. <br>2. Implement a Site Rehabilitation and Clean-up Plan after civil works, including landscaping along the fenced perimeter, maintaining hedges and field margins, and re-seeding with native plant species (soil binding grass) to stabilize soil and restore habitat. <br>3. Employ manual vegetation maintenance methods (e.g., grazing by local cattle, manual trimming) and prohibit chemical use (herbicides/pesticides). <br>4. Plant trees (not higher than PV panels) where possible around the solar plant to enhance greenery and extend habitats. |

## Title and Reference of Methodology

SECTION\_ATTEMPTED

| Type (methodology, tool or module). | Reference ID, if applicable | Title | Version |
| --- | --- | --- | --- |
| Methodology | INFO\_NOT\_FOUND: Reference ID | Environmental and Social Impact Assessment (ESIA) For 60MW Solar Plant Project of the Cambodia National Solar Park | March 2021 |
| Module | INFO\_NOT\_FOUND: Reference ID | Environmental and Social Management Plan (ESMP) | INFO\_NOT\_FOUND: Version |
| Methodology | INFO\_NOT\_FOUND: Reference ID | ADB Safeguard Policy Statement | 2009 |
| Methodology | OM Section F1/BP | ADB Operations Manual, Bank Policy | October 2013 |
| Methodology | INFO\_NOT\_FOUND: Reference ID | IFC’s Performance Standards on Environmental and Social Sustainability | 2012 |
| Guideline | INFO\_NOT\_FOUND: Reference ID | The World Bank Group General Environment, Health and Safety Guideline (EHS) | 2007 |
| Guideline | INFO\_NOT\_FOUND: Reference ID | IFC (WBG) Industry Sector EHS Guidelines for Electric Power Transmission and Distribution | 2007 |
| Guideline | INFO\_NOT\_FOUND: Reference ID | Environmental Guidelines on Air Emissions and Ambient Air Quality, Noise Management, Wastewater and Ambient Water Quality, Hazardous Material Management and Waste Management as well as Occupational Health and Safety and Community Health and Safety | 2007 |
| Framework | CCOF 2030 | ADB Climate Change Operational Framework | 20170132030 |
| Guideline | INFO\_NOT\_FOUND: Reference ID | JICA Guidelines for Environmental and Social Considerations | 2010 |
| Regulation | No. 72 | Sub-decree on Environmental Impact Assessment (EIA) process | 1999 |
| Guideline | No. 376 | Declaration on Guideline for Conducting IEIA and EIA Reports | 2009 |
| Regulation | INFO\_NOT\_FOUND: Reference ID | MoE’s Prokas on Classifying Development Projects for ESIA | 2018 |
| Tool | INFO\_NOT\_FOUND: Reference ID | AWARE climate risk-screening tool | INFO\_NOT\_FOUND: Version |
| Guideline | INFO\_NOT\_FOUND: Reference ID | Guidelines for Climate Proofing Investments in the Energy Sector | ADB, 2013 |
| Framework | INFO\_NOT\_FOUND: Reference ID | Design and Monitoring Framework | INFO\_NOT\_FOUND: Version |
| Plan | INFO\_NOT\_FOUND: Reference ID | Gender Action Plan | INFO\_NOT\_FOUND: Version |

## Applicability of Methodology

SECTION\_COMPLETE

| Methodology ID | Applicability condition | Justification of compliance |
| --- | --- | --- |
| ADB Safeguard Policy Statement (SPS 2009) | Safeguard Requirements 1: Environment | The project is classified Category B for environment. The potential environmental and social impacts of the project have been identified, and effective measures to avoid, minimize, mitigate, and compensate for the adverse impacts are incorporated in the safeguard reports and plans, and this ESIA and EMP are intended to meet SPS 2009 requirements. |
| ADB Safeguard Policy Statement (SPS 2009) | Safeguard Requirements 2: Involuntary Resettlement | The project is classified Category C for involuntary resettlement. The project does not require involuntary resettlement, and the land for the 60MW solar plant was purchased by EDC on a willing-buyer willing-seller basis, with an independent expert confirming negotiations were free, fair, transparent, and did not cause involuntary displacement impacts. |
| ADB Safeguard Policy Statement (SPS 2009) | Safeguard Requirements 3: Indigenous Peoples | The project is classified Category C for indigenous peoples. No distinct and vulnerable indigenous people groups were identified in the area, and the impact assessment for the solar park project feasibility study found no presence of such groups in the power plant project area. |
| ADB Safeguard Policy Statement (SPS 2009) | Analysis of Alternatives | During the bidding stage, site selection was conducted by a consultant team, ADB-OPPP, and EDC, where a total of seven sites were assessed for the National Solar Park location. Out of three preferred sites, two were dropped due to potential socio-economic impacts and ease and cost of land acquisition. |
| ADB Safeguard Policy Statement (SPS 2009) | Consultation and participation | Meaningful consultations were carried out with affected persons and other concerned stakeholders, including civil society, to facilitate their informed participation, as evidenced by public participation in the ESIA preparation through information booklets, public meetings, and focus group discussions where all participants supported the project. |
| ADB Safeguard Policy Statement (SPS 2009) | Information disclosure | Environmental information on the project will be translated into Khmer and made available in accessible locations (e.g., project construction field offices, commune councils, local government offices) in accordance with ADB’s Public Communications Policy (2011) and SPS (2009), and the ESIA will be disclosed on ADB’s website prior to Board approval. |
| ADB Safeguard Policy Statement (SPS 2009) | Grievance redress mechanism | PRAC will set up a project grievance redress mechanism (GRM) under its SECU/PMO to receive and facilitate resolution of project-affected persons’ concerns, complaints, and grievances about the project’s environmental and social performance. |
| ADB Safeguard Policy Statement (SPS 2009) | Monitoring and Reporting | The borrower will monitor and measure the progress of implementation of the EMP, EMOP, and safeguards tender requirements for IPPs, and report as mandated by SPS 2009, with SECU preparing Quarterly Progress Reports and annual reports for ADB/IFC and six-month reports for MoE. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | General Compliance | This ESIA and ESMP are intended to meet IFC’s PS 2012 requirements. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts | Performance Standard 1 applies to all projects with environmental and social risks and impacts, establishing the importance of integrated assessment, effective community engagement through disclosure and consultation, and management of environmental and social performance throughout the project life, all of which are addressed in the ESIA. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | Performance Standard 2: Labor and Working Conditions | The borrower will comply with national labor laws and take measures to comply with internationally recognized core labor standards, and PRAC will engage suitably qualified and experienced employees and contractors, possessing relevant qualifications, certifications, and/or licenses. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | Performance Standard 3: Resource Efficiency and Pollution Prevention | The project, by transitioning to clean solar energy, will limit import dependence on fossil fuels, contribute to national emission reduction targets, and avoid approximately 84,000 tons of carbon dioxide-equivalent (tCO2e) annually, thereby reducing pollution impacts and promoting resource efficiency. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | Performance Standard 4: Community Health, Safety, and Security | The project has implemented an ESMP to mitigate potential hazards to the community, including distributing Project Information Booklets (PIB/FAQ) and communicating on potential health and safety risks and mitigation measures, and enforcing a workers’ code of conduct. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | Performance Standard 5: Land Acquisition and Involuntary Resettlement | The 60MW solar plant is constructed on EDC-owned land leased to PRAC, which EDC purchased on a willing-buyer willing-seller basis. An external independent expert reviewed the procurement process and determined that it did not cause involuntary displacement impacts. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | Performance Standard 6: Biodiversity Conservation and Sustainable Development of Living Natural Resources | A biodiversity assessment for the project did not reveal the presence of species or habitats of particular conservation value within the project area of influence, and the project design includes measures to avoid direct and indirect impacts on biodiversity sensitivity, such as maintaining buffer zones around sensitive habitats like Praek Mkak. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | Performance Standard 7: Indigenous Peoples | No distinct and vulnerable indigenous people groups were identified in the area, and the solar park project feasibility study found no presence of such groups in the power plant project area. |
| IFC’s Performance Standards on Environmental and Social Sustainability (2012) | Performance Standard 8: Cultural Heritage | There are no known Physical Cultural Resources (PCRs) within the 60 MW solar plant site, and a Chance Find Procedures will be implemented as necessary during construction. |
| JICA Guidelines for Environmental and Social Considerations (2010) | A wide range of impacts must be addressed. | The ESIA report covers different phases of the project (design, pre-construction, construction, operation, decommissioning) and assesses potential social and environmental impacts, confirming that they can be reduced to acceptable levels with effective mitigation. |
| JICA Guidelines for Environmental and Social Considerations (2010) | Measures for environmental and social considerations must be implemented from an early stage to a monitoring stage. | The ESMP is designed to ensure continuing compliance during both construction and operation, with PRAC’s Social and Environmental Compliance Unit (SECU) monitoring project activities. |
| JICA Guidelines for Environmental and Social Considerations (2010) | JICA is responsible for accountability when implementing cooperation projects. | JICA is a cofinancing partner (“Japan International Cooperation Agency (Not ADB Administered)”) playing a key role in contributing to sustainable development in developing countries. |
| JICA Guidelines for Environmental and Social Considerations (2010) | JICA asks stakeholders for their participation. | Public participation, including village and provincial consultations, was conducted during the ESIA preparation to gather feedback from affected persons and stakeholders. |
| JICA Guidelines for Environmental and Social Considerations (2010) | JICA discloses information. | Project information, including the ESIA, is made available in Khmer and disclosed on the ADB website, adhering to transparency requirements. |
| JICA Guidelines for Environmental and Social Considerations (2010) | JICA enhances organizational capacity. | The capacity of PRAC’s Project Management Office (PMO) and its contractors for ESMP implementation, GRM, and supervision will be strengthened through appointments of focal persons and training. |
| JICA Guidelines for Environmental and Social Considerations (2010) | JICA makes serious attempts at promptness. | The project’s Grievance Redress Mechanism (GRM) includes specific timelines for resolving complaints, such as resolution within one week by SECU and 15 days by PRAC, and 30 days by the Provincial GRC, indicating promptness in addressing issues. |
| Cambodian EIA requirements (Sub-decree No.72 on Environmental Impact Assessment (EIA) issued on 11 August 1999) | Power plants that generate more than 5 MW require an IEIA or EIA. | The 60MW solar plant requires an Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP), and a Full EIA (FEIA) is required for its construction. The MoE’s Prokas on Classifying Development Projects for ESIA (2018) indicates that any power project producing more than 10MW requires an ESIA. |
| Cambodian EIA requirements (Sub-decree No.72 on Environmental Impact Assessment (EIA) issued on 11 August 1999) | MoE is responsible for review and approval of IEIA/EIA reports and monitoring the ESMP implementation. | The MoE through its EIA Department regulates and monitors the EIA process, including review and approval of reports and monitoring ESMP implementation. PRAC’s SECU will submit six-month monitoring reports to the MoE. |

## Project Boundary

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Project Boundary The project boundary for the Prime Road National Solar Park Project encompasses the 60-megawatt alternating current (MWac) solar photovoltaic (PV) power plant. This facility is located on a 97-hectare land area in Kbal Toeuk commune, Toeuk Phos district, Kampong Chhnang province, Cambodia. The physical boundary includes all infrastructure and activities directly owned, operated, or managed by Prime Road Alternative (Cambodia) Company Limited (PRAC) for the solar plant. Key components within this boundary include 164,248 PV modules (bifacial, monocrystalline, 535 Watt-peak), single-axis tracking mounting systems, 343 sets of 175kW string inverters, 20 box transformer stations (3150kVA each), 22kV underground cables, three weather stations, perimeter fencing with ground clearance, internal roads, parking areas, drainage systems, a storm water retention pond, a fire path break around the boundary, a control room, and a guard room. The environmental area of influence for the project is a 1-3 km radius around the plant site. Shared facilities of the larger National Solar Park Project, such as the main access road, the Electricit117 du Cambodge (EDC) substation, and the 230 kV transmission lines connecting to the national grid (GS6 substation), are not included within this specific project’s boundary for impact assessment.

| Scenario | Source | Gas | Included? | Justification/Explanation |
| --- | --- | --- | --- | --- |
| Baseline | Electricity generation from fossil fuels | CO2 | [X] | Primary GHG source in the baseline scenario, which the project replaces, quantified for a reduction of 110,700 tons of CO2 per annum. |
| Baseline | Electricity generation from fossil fuels | CH4 | [ ] | INFO\_NOT\_FOUND: specific quantification for CH4 emissions from baseline electricity generation in the documents. |
| Baseline | Electricity generation from fossil fuels | N2O | [ ] | INFO\_NOT\_FOUND: specific quantification for N2O emissions from baseline electricity generation in the documents. |
| Baseline | INFO\_NOT\_FOUND: Source | Other | [ ] | INFO\_NOT\_FOUND: other GHGs from baseline electricity generation in the documents. |
| Project | Operational phase of solar plant | CO2 | [X] | The project’s solar power generation is a clean energy source and does not directly emit CO2 during operation, leading to avoided emissions. |
| Project | Operational phase of solar plant | CH4 | [X] | The project’s solar power generation does not directly emit CH4 during operation, leading to avoided emissions. |
| Project | Operational phase of solar plant | N2O | [X] | The project’s solar power generation does not directly emit N2O during operation, leading to avoided emissions. |
| Project | Operational phase of solar plant | Other | [ ] | INFO\_NOT\_FOUND: other GHGs from solar plant operation in the documents. |
| Project | Leakage: Material transport and PV panel production | CO2 | [X] | Trans-boundary and life cycle GHG emissions associated with the manufacturing and transportation of solar photovoltaic panels and other equipment. |
| Project | Leakage: Material transport and PV panel production | CH4 | [ ] | INFO\_NOT\_FOUND: specific quantification for CH4 emissions from material transport or PV production. |
| Project | Leakage: Material transport and PV panel production | N2O | [ ] | INFO\_NOT\_FOUND: specific quantification for N2O emissions from material transport or PV production. |
| Project | Leakage: Material transport and PV panel production | Other | [ ] | INFO\_NOT\_FOUND: other GHGs from material transport or PV production. |

INFO\_NOT\_FOUND: diagram or map

## Baseline Scenario

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Baseline Scenario

The baseline scenario, also referred to as the “Without Project Scenario,” describes the conditions that would prevail in the absence of the Prime Road National Solar Park Project. It represents a continuation of Cambodia’s existing energy supply structure and associated environmental and socio-economic conditions.

Justification of the Baseline Scenario

The baseline scenario is justified by Cambodia’s pre-project energy sector characteristics and related development challenges: 1. Energy Mix: Cambodia’s power supply heavily relies on hydropower, coal, diesel, and imports from neighboring countries. As of end-2019, installed capacity totaled 2,756 MW, with hydropower at 48% and coal at 24%. In the absence of the project, this dependence on fossil fuels and imports would continue. 2. Electricity Demand and Cost: Total electricity demand grew significantly from 2,077 GWh in 2009 to 12,015 GWh in 2019 and is projected to reach 24,184 GWh by 2025. Without alternative sources like the solar park, Cambodia would face continued challenges with high electricity prices (e.g., residential price of $0.15 per kWh in mid-2019, higher than several neighboring countries) and potential supply interruptions, which are identified as major impediments to economic competitiveness. 3. Environmental Impact: Continued reliance on fossil fuel-based energy generation in the baseline scenario would lead to an increase in greenhouse gas (GHG) emissions, contrary to national emission reduction targets. 4. Socio-economic Conditions: In the baseline, communities in the project area, such as Kbal Tuek commune, would continue to experience limited grid connectivity (61% of households used batteries as primary electricity source in 2015), and the existing poverty rate of 22% (2015 data for Kbal Tuek) would persist without new job creation from the project. Economic development would remain slow. 5. Land Use: The project land (97 ha) would continue to be modified scrubland and paddy fields, formerly used for cassava plantations and currently for grazing, without the conversion to a solar power plant. This baseline establishes the “no project” alternative against which the project’s interventions and their positive impacts (e.g., GHG reductions, diversified energy mix, lower electricity costs, employment generation) can be measured.

Procedure Set Out in the Applied Methodology and Relevant Tools

The procedure for establishing the baseline scenario was conducted in accordance with the ADB Safeguard Policy Statement (2009), IFC Performance Standards (2012), and the Cambodian Ministry of Environment’s 2009 IEIA/EIA preparation guideline. The process involved several steps:

Determination of Baseline Data Requirements:

Application: The assessment ensured that baseline data collected covered relevant physical, biological, and socio-economic conditions, as mandated by both international and national environmental assessment requirements.

Outcome: A comprehensive scope for baseline data collection was established, covering all essential environmental and social parameters.

Definition of Spatial and Temporal Scope:

Application: The spatial scope included the 97 ha project site, a 3 km radius for ecological impacts, and broader considerations for issues like wildlife migration and downstream water quality. The temporal scope covered all project phases: design, pre-construction, construction, operation, and decommissioning, though baseline data itself was collected once.

Outcome: The study area for baseline assessment was precisely delineated, and data collection considered seasonal and long-term trends relevant to the project’s lifespan.

Data Collection (Primary and Secondary):

Application: Primary data was collected through field sampling in September 2020 for soil, air, noise, vibration, and surface/groundwater quality. Socio-economic surveys and stakeholder consultations with local villagers, commune chiefs, and district governors were conducted in September and October 2020. Biodiversity assessments were also performed. Secondary data involved reviewing existing studies, such as the NSP Feasibility Study, regional meteorological records, and government policy documents.

Outcome: A robust dataset was compiled, integrating ground-level observations with existing scientific and policy information to characterize the pre-project environment and socio-economic conditions.

Characterization of the Existing (Baseline) Environment:

Application: The collected data was systematically analyzed and documented across various environmental and social categories.

Outcome: A detailed baseline profile was created, including:

Physical Resources: Gently undulating topography (80-200m elevation), clayey/inferior soils (predominantly Grey hydromorphics and red-yellow podzols), tropical monsoon climate (mean max temp 35.2°C, annual rainfall 1,517mm), good ambient air quality (parameters mostly below standards), moderate noise levels (some exceeding IFC residential night-time guideline), low vibration, surface water suitable for ecosystems but not drinking (high coliforms), groundwater suitable for domestic use but not drinking (some Fe/Al exceedances), presence of two streams (Praek Mkak, small canal) draining into An Long Chrey Reservoir, and medium climate risk (flooding, landslides). UXOs were cleared by December 2020.

Ecological Resources: Modified scrubland and paddy field habitat, no protected areas at the solar plant site, but Phnom Aural Wildlife Sanctuary (20 km away) and Tbeng Srorng Community Forest (5-7 km away). Flora and fauna surveys identified mostly Least Concern species, with a few Nearly Threatened (Shorea Obtusa, Curcuma alismatifola) and Vulnerable (Indochinese Spitting Cobra, King Cobra) species reported in the wider area but not directly at the site. No critical habitats or endemic species were found within the project’s direct influence.

Socio-Economic Profile: Average household size of 4-5 persons (Khmer ethnicity), varying education levels (15% illiterate), primary occupation farming (55%), low to medium annual incomes, universal household electricity access but high reliance on firewood for cooking, diverse water sources (rainwater, wells, streams), limited health facilities, light local traffic, and no physical cultural resources (PCRs) on the project site (temples and a church are nearby).

Key Assumptions, Rationale, and Methodological Choices

Key Assumptions:

The “Without Project Scenario” assumes that without this specific intervention, Cambodia’s energy sector would continue its current trajectory of high dependency on non-renewable and imported sources, leading to unaddressed issues of cost, GHG emissions, and energy security.

It assumes that the identified local socio-economic conditions and land uses in the project area would persist without significant change.

Rationale:

The rationale for defining this baseline is to provide a clear, factual basis for demonstrating the project’s “additionality”—the benefits it brings that would not otherwise occur. By establishing this scenario, the project’s contributions to climate change mitigation (reducing 110,700 tons of CO2e annually), energy security, economic growth, and social development can be rigorously evaluated against a credible alternative.

The baseline highlights the existing market failures (e.g., inability of local financial institutions to provide long-term USD-denominated project financing) and policy gaps (e.g., unintegrated renewable energy and gender equality policies) that the project aims to address.

Methodological Choices:

Adherence to Standards: The consistent application of ADB SPS 2009, IFC Performance Standards 2012, and Cambodian EIA guidelines ensures that the baseline assessment is thorough, credible, and compliant with both international best practices and national regulations.

Comprehensive Data Collection: The use of a mix of primary and secondary data, alongside multiple assessment tools (field surveys, consultations, laboratory tests, literature review), provides a holistic and accurate picture of the baseline environment, minimizing data gaps.

Defined Area of Influence: Specifying a direct project footprint and a broader area of influence (e.g., 3km radius for ecology) is a targeted approach to ensure that all potentially affected receptors are considered in the baseline.

Systematic Impact Assessment: Employing checklists, matrix tables, and GIS overlaying, combined with a four-criteria framework for impact significance (spatial, temporal, magnitude, reversibility, and livelihood impacts), allows for a structured and quantifiable understanding of the “without project” situation.

Relevant References: \* Prime Road FUNDING PROPOSAL.pdf \* Prime Road ENVIRONMENTAL IMPACT.pdf \* Prime Road POVERTY AND SOCIAL ANALYSIS.pdf \* Prime Road GENDER ACTION PLAN.pdf

## Additionality

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Additionality

Demonstrate and assess the additionality of the project, in accordance with the applied methodology and any relevant tools, taking into account the following additionality methods:

Regulatory Surplus

Is the project located in an or Non-Annex 1 country?

Annex 1 country [X] Non-Annex 1 country

Are the project activities mandated by any law, statute, or other regulatory framework?

[ ] Yes [X] No

If the project is located inside a Non-Annex 1 country and the project activities are mandated by a law, statute, or other regulatory framework, are such laws, statutes, or regulatory frameworks systematically enforced?

INFO\_NOT\_FOUND: information INFO\_NOT\_FOUND: information

If no, describe which mandated laws, statutes, or other regulatory frameworks require project activities and provide evidence of systematic non-enforcement to demonstrate regulatory surplus.  
INFO\_NOT\_FOUND: mandated laws, statutes, or other regulatory frameworks require project activities and provide evidence of systematic non-enforcement to demonstrate regulatory surplus.

Additionality Methods

Where a project method is applied to demonstrate additionality and the procedure in the applied methodology or tool involves several steps, describe how each step is applied and clearly document the outcome of each step. Indicate clearly the method selected to demonstrate additionality (e.g., investment analysis or barrier analysis in the case of the CDM Tool for the demonstration and assessment of additionality). Where barrier analysis, or equivalent, is used to demonstrate additionality, only include the most relevant barriers. Justify the credibility of the barriers with key facts and/or assumptions and the rationale. Provide all relevant references.

INFO\_NOT\_FOUND: Project method applied to demonstrate additionality, procedure, steps, outcomes, justification, and references.

Where a performance method is applied to demonstrate additionality, demonstrate that performance can be achieved to a level at least equivalent to the performance benchmark metric.

INFO\_NOT\_FOUND: Performance method applied to demonstrate additionality, demonstration of performance to benchmark metric.

Where the methodology applies an activity method for the demonstration of additionality, include a statement that notes that conformance with the positive list is demonstrated in the Applicability of Methodology section above.

INFO\_NOT\_FOUND: Activity method applied for demonstration of additionality, statement of conformance with positive list.

Provide sufficient information (including all relevant data and parameters, with sources) so that a reader can reproduce the additionality analysis and obtain the same results. INFO\_NOT\_FOUND: Sufficient information (including all relevant data and parameters, with sources) to reproduce the additionality analysis and obtain the same results.

## Methodology Deviations

SECTION\_ATTEMPTED

INFO\_NOT\_FOUND: Methodology Deviations

## Baseline Emissions

SECTION\_ATTEMPTED

INFO\_NOT\_FOUND: Describe the procedure for quantification of baseline emissions and/or carbon stock changes in accordance with the applied methodology. Baseline emissions may be negative where carbon stock increases (sinks) exceed baseline emissions. Specify the reductions and removals separately where the applied methodology provides procedures and equations to do so. Include all relevant equations here and provide sufficient information to allow the reader to reproduce the calculations. Explain and justify all relevant methodological choices (e.g., with respect to selection of emission factors and default values). Include all calculations in the emission reduction and removal calculation spreadsheet.

## Project Emissions

SECTION\_ATTEMPTED

INFO\_NOT\_FOUND: The procedure for quantification of project emissions and/or carbon stock changes in accordance with the applied methodology is not described. No specific procedures or equations are provided to separate reductions and removals. The documents do not explain or justify relevant methodological choices such as emission factors or default values. No emission reduction and removal calculation spreadsheet is included or referenced with sufficient detail to allow reproduction of calculations. However, the project is stated to contribute to climate change mitigation efforts by reducing annual greenhouse gas (GHG) emissions. - The Prime Road FUNDING PROPOSAL.pdf states that the project will result in “GHG reductions (tons per annum) 110,700” and will “reduce annual greenhouse gas emissions in the energy sector by 110,700 tons per year.” It also notes: “Annual amount of emission reductions achieved: 110,700 tons of carbon dioxide (2020 baseline: 0).” - The Prime Road ENVIRONMENTAL IMPACT.pdf states that “The operation of a 60 MW solar PV plant will avoid approximately 84,000 tons of carbon dioxide-equivalent (tCO2e) annually. For a lifetime, the project will contribute to the reduction of emissions upto 1,760,000 tCO2e.”

## Leakage Emissions

SECTION\_COMPLETE

An error occurred while asking Gemini: 429 You exceeded your current quota, please check your plan and billing details. For more information on this error, head to: https://ai.google.dev/gemini-api/docs/rate-limits. [violations { quota\_metric: “generativelanguage.googleapis.com/generate\_content\_free\_tier\_input\_token\_count” quota\_id: “GenerateContentInputTokensPerModelPerMinute-FreeTier” quota\_dimensions { key: “model” value: “gemini-2.5-flash” } quota\_dimensions { key: “location” value: “global” } quota\_value: 250000 } , links { description: “Learn more about Gemini API quotas” url: “https://ai.google.dev/gemini-api/docs/rate-limits” } , retry\_delay { seconds: 35 }]

## Estimated GHG Emission Reductions and Carbon Dioxide Removals

SECTION\_ATTEMPTED

INFO\_NOT\_FOUND: Procedure for the quantification of estimated GHG emission reductions and carbon dioxide removals, including relevant equations, how each equation is applied, and calculations for all key equations. The documents provide annual estimated GHG emission reductions but do not detail the quantification methodology or equations used to derive these figures.

For projects that are not required to assess permanence risk, complete the table below for the project crediting period:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Vintage period | Estimated baseline emissions (tCO2e) | Estimated project emissions (tCO2e) | Estimated leakage emissions (tCO2e) | Estimated reduction VCUs (tCO2e) | Estimated removal VCUs (tCO2e) | Estimated total VCUs (tCO2e) |
| 29-Jun-2022 to 31-Dec-2022 | INFO\_NOT\_FOUND: Estimated baseline emissions | INFO\_NOT\_FOUND: Estimated project emissions | INFO\_NOT\_FOUND: Estimated leakage emissions | 56360.27 | 0 | 56360.27 |
| 01-Jan-2023 to 31-Dec-2041 | INFO\_NOT\_FOUND: Estimated baseline emissions | INFO\_NOT\_FOUND: Estimated project emissions | INFO\_NOT\_FOUND: Estimated leakage emissions | 2103300 | 0 | 2103300 |
| 01-Jan-2042 to 28-Jun-2042 | INFO\_NOT\_FOUND: Estimated baseline emissions | INFO\_NOT\_FOUND: Estimated project emissions | INFO\_NOT\_FOUND: Estimated leakage emissions | 54409.84 | 0 | 54409.84 |
| Total | INFO\_NOT\_FOUND: Estimated baseline emissions | INFO\_NOT\_FOUND: Estimated project emissions | INFO\_NOT\_FOUND: Estimated leakage emissions | 2214070.11 | 0 | 2214070.11 |

## Data and Parameters Available at Validation

SECTION\_ATTEMPTED

```  
| Data / Parameter | |  
| --- | --- |  
| Data unit | tons of carbon dioxide per annum |  
| Description | Annual amount of emission reductions achieved |  
| Source of data | Prime Road FUNDING PROPOSAL.pdf (Page 6), Prime Road FUNDING PROPOSAL.pdf (Page 7), Prime Road FUNDING PROPOSAL.pdf (Page 15) |  
| Value applied | 110,700 |  
| Justification of choice of data or description of measurement methods and procedures applied | The project will contribute to ADB’s climate change mitigation efforts by reducing annual greenhouse gas emissions in the energy sector by 110,700 tons per year. The project will supply Cambodia’s electricity grid with solar power and help reduce 110,700 tons of carbon dioxide per annum by 2023. |  
| Purpose of data | Calculation of baseline emissions |  
| Comments | INFO\_NOT\_FOUND: <information> |  
```

|  |  |
| --- | --- |
| Data / Parameter |  |
| Data unit | *Indicate the unit of measure* |
| Description | *Provide a brief description of the data/parameter* |
| Source of data | Indicate the source(s) of data |
| Value applied | Provide the value applied |
| Justification of choice of data or description of measurement methods and procedures applied | Justify the choice of data source, providing references where applicable. Where values are based on measurement, include a description of the measurement methods and procedures applied (e.g., what standards or protocols have been followed), indicate the responsible person/entity that undertook the measurement, the date of the measurement and the measurement results. More detailed information may be provided in an appendix. |
| Purpose of data | Indicate one of the following:   * Determination of baseline scenario (AFOLU projects only) * Calculation of baseline emissions * Calculation of project emissions * Calculation of leakage |
| Comments | Provide any additional comments |

## Data and Parameters Monitored

SECTION\_ATTEMPTED

```markdown  
| Data / Parameter | |  
| --- | --- |  
| Data unit | tons of carbon dioxide (tCO2e) |  
| Description | Annual amount of emission reductions achieved by the operation of a 60 MW solar PV plant. |  
| Source of data | Annual development effectiveness monitoring reports by the borrower. |  
| Description of measurement methods and procedures to be applied | INFO\_NOT\_FOUND: Description of measurement methods and procedures to be applied |  
| Frequency of monitoring/recording | Annually |  
| Value applied | 84,000 |  
| Monitoring equipment | INFO\_NOT\_FOUND: Monitoring equipment |  
| QA/QC procedures to be applied | INFO\_NOT\_FOUND: QA/QC procedures to be applied |  
| Purpose of data | Calculation of project emissions |  
| Calculation method | INFO\_NOT\_FOUND: Calculation method |  
| Comments | The document states 84,000 tons of carbon dioxide-equivalent (tCO2e) annually for a 60 MW project. Another section mentions 110,700 tons of carbon dioxide per annum by 2023 for the project. Using the 84,000 tCO2e as it directly refers to the 60MW plant. |  
```

|  |  |
| --- | --- |
| Data / Parameter |  |
| Data unit | Indicate the unit of measure |
| Description | Provide a brief description of the data/parameter |
| Source of data | Indicate the source(s) of data |
| Description of measurement methods and procedures to be applied | Specify the measurement methods and procedures, any standards or protocols to be followed, and the person/entity responsible for the measurement. Include any relevant information regarding the accuracy of the measurements (e.g., accuracy associated with meter equipment or laboratory tests). |
| Frequency of monitoring/recording | Specify measurement and recording frequency |
| Value applied | Provide an estimated value for the data/parameter |
| Monitoring equipment | Identify equipment used to monitor the data/parameter including type, accuracy class, and serial number of equipment, as appropriate. |
| QA/QC procedures to be applied | Describe the quality assurance and quality control (QA/QC) procedures to be applied, including the calibration procedures where applicable. |
| Purpose of data | Indicate one of the following:   * Calculation of baseline emissions * Calculation of project emissions * Calculation of leakage |
| Calculation method | Where relevant, provide the calculation method, including any equations, used to establish the data/parameter. |
| Comments | Provide any additional comments |

## Monitoring Plan

SECTION\_ATTEMPTED

Monitoring Plan

* The methods for measuring, recording, storing, aggregating, collating and reporting on monitored data and parameters. Where relevant, include the procedures for calibrating monitoring equipment.  
  \*\*Measurement Methods:\*\*  
  \* \*\*Weather Data:\*\* Three on-site weather stations will measure solar resource (on front and rear side of PV module), ambient and PV module temperature, wind speed, rainfall, and humidity using pyranometers and temperature, wind speed, rainfall, and humidity sensors.  
  \* \*\*Air Quality:\*\* Field sampling (September 2020) conducted with MoE laboratory team using OCEANUS OC-9500 (Dust Monitor System) and GRI-IAT (Real-time Monitor) for parameters including Total Suspended Particles (TSP), Sulfur Dioxide (SO2), Carbon Monoxide (CO), Nitrogen Dioxide (NO2), Particulate Matter (PM10), Particulate Matter (PM2.5), Ozone (O3), and Lead (Pb). Hand-held air monitoring devices will also be utilized.  
  \* \*\*Noise and Vibration:\*\* Field sampling (September 2020) using hand-held noise monitors to measure A-weighted decibel (dBA) for noise and decibel (dB) for vibration.  
  \* \*\*Surface Water Quality:\*\* Field sampling (22 September 2020) using multi-parameter water quality probes. Samples are collected in labeled bottles without headspace, using gloves to prevent contamination, chilled, and containing appropriate preservatives for analysis at an accredited analytical laboratory (MoE's laboratory). Parameters include Temperature, pH, Total Suspended Solid (TSS), Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD5), Chemical Oxygen Demand (COD), Total Nitrogen (TN), Total Phosphorus (TP), Total Dissolved Solid (TDS), Oil or Grease, Detergent, Sulfate (SO4), Arsenic (As), Iron (Fe), Mercury (Hg), and Total Coliform.  
  \* \*\*Groundwater Quality:\*\* Field sampling (during rainy season) using multi-parameter water quality probes. Samples are collected in bottles with appropriate preservatives for analysis at an accredited analytical laboratory (MoE's laboratory). Parameters include pH, Turbidity, Electrode Conductivity (EC), Total Dissolved Solid (TDS), Total Hardness (CaCO3), Chloride (Cl), Fluoride (F), Nitrate (NO3), Sulfate (SO4), Iron (Fe), Arsenic (As), Mercury (Hg), Chromium (Cr), Manganese (Mn), Aluminium (Al), Benzene (C6H6), Cadmium (Cd), Total Coliform, and E-Coli.  
  \* \*\*Soil Quality:\*\* Field sampling (22 September 2020) using a soil auger to drill 50cm deep to collect multiple soil cores (total 0.5kg). Samples are kept in a clean, labeled plastic bag and submitted to the MAFF's laboratory on the same day. Parameters include particle size (clay, fine/coarse silt, fine/coarse sand), Moisture %, Total Carbon (TC), Total Nitrogen (TN), C/N Ratio, Organic Matter (OM), Total Phosphorus (P2O5), Available Phosphorus (P2O5), Cation Exchange Capacity (C.E.C), Calcium (Ca), Magnesium (Mg), Sodium (Na), Potasium (K), Total Exchangeable Bases, Bass Saturation, Exchange Acidity, Exchange Al, Electrode Conductivity, pH H2O, and pH KCL.  
  \*\*Recording:\*\*  
  \* Logs of monitoring, incidences of non-compliance, and rectification will be recorded and maintained (for air quality, noise, and vibration).  
  \* PRAC's Social and Environmental Compliance Unit (SECU) will maintain records of all grievances received, including contact details of complainants, dates, nature of grievance, agreed corrective actions, and final outcomes.  
  \* A personnel training register will be maintained.  
  \*\*Storing:\*\*  
  \* Proper storages, including covered on-site storing, sorting, and recycling areas away from water sources, drainage/irrigation canals, or other water sources, will be established for broken/redundant solar panels.  
  \* Temporary secured hazardous materials handling and waste storage areas will be provided across all work sites.  
  \*\*Aggregating, Collating, and Reporting:\*\*  
  \* Operation analysis will be conducted monthly, quarterly, and annually. Reports will analyze and compare equipment operation, power grid performance, sunlight exposure changes, and production task completion against previous data to detect problems.  
  \* The SECU will prepare the project's Quarterly Progress Reports (QPR) for submission to the National Solar Park (NSP) Electricité du Cambodge (EDC)’s Project Implementation Consultant (PIC), with six-month submissions also going to the Ministry of Environment (MoE).  
  \* During the construction period, one monitoring report will be submitted to ADB/IFC, and during the operation period, annual reports will be submitted to ADB/IFC until project completion.  
  \* Bi-monthly monitoring reports will be submitted to Lenders during peak construction.  
  \* Quarterly monitoring reports will be submitted to NSP EDC's PIC during construction.  
  \* Six-month and annual monitoring reports will be submitted to the Ministry of Environment.  
  \* Monitoring reports will be publicly disclosed on the ADB/IFC website.  
  \*\*Equipment Calibration Procedures:\*\*  
  INFO\_NOT\_FOUND: Procedures for calibrating monitoring equipment.
* The organizational structure, responsibilities and competencies of the personnel that will be carrying out monitoring activities.  
  \*\*Organizational Structure:\*\*  
  Prime Road Alternative (Cambodia) Company Limited (PRAC) will establish a Project Management Office (PMO). The PMO will consist of:  
  \* A Social and Environmental Compliance Unit (SECU), which will engage an external consultant team.  
  \* A Construction and Engineering Unit (CEU), which manages PRAC’s turnkey contracts and sub-contractors.  
  \* An Operation and Maintenance Unit (OMU).  
  Within the SECU, PRAC will appoint a team of external consultants including an environment officer, a social officer, and an HS (Health and Safety) officer.  
  \*\*Responsibilities:\*\*  
  \* \*\*PRAC PMO:\*\* Provides management support to SECU, CEU, and OMU. Responsible for day-to-day management, supervising and overseeing the 60MW solar plant’s compliance with loan covenants, environmental safeguards, coordinating the project Grievance Redress Mechanism (GRM), coordinating with line ministries, supervising the procurement process, and reporting to ADB/IFC.  
  \* \*\*SECU:\*\* Responsible for environmental reporting and ensuring compliance checks and environmental monitoring. Monitors project activities for continuing compliance with the Environmental and Social Management Plan (ESMP) during construction and operation. Prepares Quarterly Progress Reports (QPR) and other monitoring reports. Coordinates with EDC’s PIC to ensure compliance with lender (ADB/IFC) safeguards and consistency with government policy, legal, and administrative frameworks. Appoints at least one environment focal person and one social focal person for ESMP coordination, implementation, and site inspections, including project GRM.  
  \* \*\*CEU:\*\* Develops, plans, and implements project activities regarding the ESMP during construction. Ensures their staff and sub-contractors follow the ESMP and relevant social and environmental safeguard policies.  
  \* \*\*Contractors/Subcontractors:\*\* Responsible for implementing mitigation measures during construction and operation under SECU’s supervision. Expected to develop and plan activities in accordance with the ESMP during construction. Appoint at least one C-EHS (Environment, Health and Safety Officer) for ESMP coordination, implementation, site inspections, and information disclosure/consultations. Appoint at least one C-GRM (GRM focal person) for GRM coordination, handling complaints, dispute resolution, site visits, and information disclosure/consultations.  
  \* \*\*OMU:\*\* Develops, plans, and implements project activities regarding the ESMP during operation.  
  \* \*\*O&M Contractors/Subcontractors:\*\* Develop and plan activities in accordance with the ESMP during operation, and implement activities regarding the ESMP during operation.  
  \* \*\*EDC’s NSP PIC:\*\* Oversees and ensures that PRAC complies with the ESMP and relevant regulations. Conducts compliance monitoring to verify ESMP and Environmental Monitoring Plan (EMOP) compliance during project implementation.  
  \*\*Competencies:\*\*  
  \* PRAC will engage suitably qualified and experienced employees and contractors with relevant qualifications, certifications, and/or licenses.  
  \* External specialists will be engaged for additional expertise when needed, ensuring they are suitably qualified and experienced.  
  \* International professionals will be employed to train and mentor local professionals.  
  \* Periodic training systems are in place: Annual, quarterly, monthly, and weekly training plans based on personnel and equipment needs.  
  \* All construction and operation & maintenance (O&M) personnel on duty for electrical work must possess an electrician certificate for high voltage special operation (issued by power supply bureau) and a power grid access permit for electricians.  
  \* Annual examinations will be held on Power Safety Work Procedure (electrical part of power plant and substation), local Dispatch Operation Regulations, and Field Operation Regulations at the Photovoltaic Power Station. Annual professional skills examinations will also be conducted.  
  \* Monthly technical lectures, on-site questioning, on-duty prediction failure exercises, and quarterly anti-accident exercises will be organized.
* The procedures for internal auditing and QA/QC.  
  \*\*Internal Auditing:\*\*  
  INFO\_NOT\_FOUND: Procedures for internal auditing.  
  \*\*QA/QC:\*\*  
  \* The Social and Environmental Compliance Unit (SECU) is responsible for environmental reporting and ensuring compliance checks and environmental monitoring.  
  \* Compliance monitoring will be conducted by the Electricité du Cambodge (EDC) National Solar Park (NSP) Project Implementation Consultant (PIC) to verify Environmental and Social Management Plan (ESMP) and Environmental Monitoring Plan (EMOP) compliance during project implementation.  
  \* All chemicals and hydrocarbons will be handled and stored appropriately according to the ESMP and associated standard operation procedures, with adequate bunding, inspection, and auditing measures.  
  \* Field sampling for air, noise, vibration, soil, and water quality is carried out by the MoE laboratory team, MAFF's laboratory, or accredited analytical laboratories, following specific sample collection and preservation methods.
* The procedures for handling non-conformances with the validated monitoring plan.  
  Non-conformances with the monitoring plan will be handled through a multi-step Grievance Redress Mechanism (GRM), which is structured as follows:  
  \* \*\*Step 1 (Commune Council/SECU):\*\* Complaints (verbal or written) are submitted to the commune council via the village or commune chief, who provides immediate written receipt and forwards them to PRAC’s Social and Environmental Compliance Unit (SECU). The SECU is responsible for resolving the issue within one week through negotiation and maintaining records of complaints and resolutions.  
  \* \*\*Step 2 (PMO/PRAC):\*\* If the affected person is not satisfied with the resolution or if the issue remains unresolved, the complaint is escalated to PRAC’s Project Management Office (PMO) via the commune council. PRAC has 15 days to resolve the complaint through negotiation.  
  \* \*\*Step 3 (District Office):\*\* If the complaint remains unresolved or unsatisfactory after Step 2, the issue is brought to the District office, which has 15 days for negotiation and resolution.  
  \* \*\*Step 4 (Provincial GRC):\*\* If the District office cannot resolve the issue, it is brought to the provincial Grievance Redress Committee (GRC). The GRC must make a written decision within 30 days and inform both the affected person and SECU/PRAC.  
  \* \*\*Step 5 (Provincial Court/Higher Court):\*\* If the affected person is still unsatisfied, they can take the case to the Provincial Court, and then to a higher-level court if necessary.  
  \* \*\*Step 6 (Lender Accountability Mechanism):\*\* If internal dispute resolution remains unresolved or unsatisfactory, affected persons can contact ADB’s Energy Division, Southeast Asia Department or ADB Cambodia Resident Mission (CARM), and IFC’s ombudsman office. If still unsatisfied, they can contact the ADB Office of the Special Project Facilitator through the accountability mechanism.  
  Additionally, logs of monitoring, including incidences of non-compliance and rectification, will be recorded and maintained by the responsible parties (e.g., contractors for air quality and noise/vibration monitoring, SECU for grievances).
* Any sampling approaches used, including target precision levels, sample sizes, sample site locations, stratification, frequency of measurement and QA/QC procedures.  
  \*\*Sampling Approaches:\*\*  
  \* \*\*Sample Site Locations:\*\*  
   \* \*\*Air Quality, Noise, and Vibration:\*\* Two locations were sampled: (1) within the project site (ANV01: X=434264, Y=1303047) and (2) near the existing access road (ANV02: X=439465, Y=1303928).  
   \* \*\*Surface Water Quality:\*\* Two locations were sampled: (1) in Preak Mkak close to the project boundary (SW01: X=433561, Y=1303122) and (2) in a small canal within the project boundary (SW02: X=434129, Y=1303449).  
   \* \*\*Groundwater Quality:\*\* One sample was collected from a well in a village 2km north of the plant site (GW: X=433492, Y=1306328), with a well depth of around 40 meters.  
   \* \*\*Soil Quality:\*\* One soil sample was collected (X=433651, Y=1303521).  
  \* \*\*Target Precision Levels:\*\* INFO\_NOT\_FOUND: Target precision levels.  
  \* \*\*Sample Sizes:\*\* INFO\_NOT\_FOUND: Sample sizes, beyond the number of sampling points specified above for each environmental parameter.  
  \* \*\*Stratification:\*\* INFO\_NOT\_FOUND: Stratification methods.  
  \* \*\*Frequency of Measurement:\*\*  
   \* \*\*Air Quality, Noise, Vibration:\*\* Baseline (once before civil works), bi-monthly (during civil works), once (after civil works completion). Operation: Annually.  
   \* \*\*Surface Water Quality, Groundwater Quality:\*\* Baseline (once before civil works), once (during civil works), once (after civil works completion). Operation: Annually (Surface Water), Every six months (Groundwater).  
   \* \*\*Hydrology:\*\* Every six months (construction and operation).  
   \* \*\*Soil Quality:\*\* Every six months (construction and operation).  
   \* \*\*Vegetation, Fauna, Fishery Impacts:\*\* Once (during civil work), every six months (to MoE/EDC for construction). Operation: Every six months (to MoE/EDC), annually (to Lenders). PRAC will conduct annual monitoring for flora, fauna, and fishery resources on site during operation.  
   \* \*\*Occupational Health and Safety:\*\* Bi-monthly (during civil works), every six months (to MoE/EDC during operation), annually (to Lenders during operation).  
   \* \*\*Community Health and Safety:\*\* Once (during civil work), every six months (to MoE/EDC during operation), annually (to Lenders during operation).  
  \* \*\*QA/QC Procedures:\*\*  
   \* Environmental sampling and analysis are conducted by the MoE laboratory team, MAFF's laboratory, or other accredited analytical laboratories.  
   \* Field parameters are monitored using multi-parameter water quality probes.  
   \* Soil samples are collected using a soil auger for best estimate of nutrient levels, with multiple cores taken to reduce variability.  
   \* Water samples are collected in labeled bottles using gloves, without headspace, chilled, and with appropriate preservatives.  
   \* Compliance monitoring is conducted by EDC’s NSP PIC to verify ESMP and EMOP adherence.

Where appropriate, include line diagrams to display the GHG data collection and management system.  
INFO\_NOT\_FOUND: Line diagrams to display the GHG data collection and management system.

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#### Appendix 1: Commercially sensitive information

#### Use the table below to describe the commercially sensitive information included in the project description to be excluded in the public version.

| Section | Information | Justification |  
| --- | --- | --- |  
| Nonsovereign Operation Risk Rating | Final Project Rating for Prime Road Alternative (Cambodia) Company Limited | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Nonsovereign Operation Risk Rating | Facility Risk Rating for Prime Road Alternative (Cambodia) Company Limited | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Borrower and Sponsor | Market capitalization of Prime Road Power Public Company Limited in relation to other assets | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Project Cost and Financing Plan | Detailed breakdown of the Project Cost and Financing Plan (Section II.D, paragraph 23) | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Implementation Arrangements | Specifics of implementation period beyond the commercial operations date, construction arrangements, contractor/subcontractor/supplier identities, further details on the revenue structure, and operation and maintenance plans (Table 4: Summary of Implementation Arrangements) | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Risks | Additional specifics related to project risks (Section III.C) | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Safeguards and Social Dimensions | Detailed information related to involuntary resettlement and indigenous peoples safeguards (Section IV.A, paragraph 32) | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Design and Monitoring Framework | Specific performance indicators, targets, baselines, and critical assumptions within the Design and Monitoring Framework for project outcome and outputs (Appendix 1) | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Gender Action Plan | Further details on the Gender Action Plan (Section IV.A, paragraph 34; Gender Action Plan, Table 1) | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |  
| Investment Limitations | Specific investment limitations (Section IV.C, paragraph 37) | subject to exceptions to disclosure set forth in ADB’s Access to Information Policy. |