

## Evaluation Approach

# Project Performance Evaluation Report (PPER) for Investment No. 7314 and Loan No. 2678-THA: Bangchak Solar Power Project

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Team Leader: Alfredo Baño, Evaluation Specialist ([abano@adb.org](mailto:abano@adb.org))

Contact: [evaluation@adb.org](mailto:evaluation@adb.org)

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## A. Background

1. As part of the Government of Thailand's strategy of diversifying the energy mix (71% natural gas and 19% coal at the time of project appraisal) and promoting renewable energy, the government's Alternative Energy Development Plan 2008–2022 set a target of 20.3% for renewable energy installed capacity by 2022, which implied a total renewable energy capacity of 5,608 MW by 2022, a significant increase from 1,754 MW in 2007.
2. In October 2010, the Board of Directors of the Asian Development Bank (ADB) approved financing for the Bangchak Solar Power Project for the development of two solar power plants with a total gross capacity of 44.5 megawatts (MW) to support this strategy.
3. The financing comprised two loans to the Bangchak Petroleum Public Company Limited (BCP), a leading integrated oil refining and marketing company in Thailand. The first loan of up to B969 million (Facility A) financed the project's Plant A with 10 MW of installed capacity, and the second loan of up to B3.231 million (Facility B) financed the project's Plant B with 34.5 MW of installed capacity. The project was financed on a corporate basis with both facilities having a term of up to 15 years. Facility B had an unfunded risk participation from Mizuho Bank covering the entire outstanding principal, interest, fees, and breakage costs arising under the tranche B loan for the first 7 years. Both plants share the same project site, but were planned to be built and commissioned at a different time, hence the loans also had different time schedules and conditions.
4. The ADB Board also approved a capacity development technical assistance (CDTA) of up to \$400,000 to support the implementation of carbon-neutral strategies of BCP and other private energy companies in developing member countries (DMCs), which will also be evaluated in this exercise.
5. The evaluation findings are expected to provide inputs to relevant ADB departments regarding development impacts, ADB assistance effectiveness, fiduciary procedures efficiency, policy analysis, and contribution to the Thailand CPS.

## **B. Project Highlights**

6. The project involved the construction of two solar power generation plants, both situated in the Ayutthaya province of Central Thailand. Plant A has a gross capacity of 10 MW and is covered by a 5-year automatically renewable purchase power agreement (PPA) with the Provincial Electricity Authority (PEA) under its very small power producer (VSPP) program. Plant B has a gross capacity of 34.5 MW and is covered by a 5-year automatically renewable PPA with the Electricity Generating Authority of Thailand (EGAT) under its small power producer (SPP) program. EGAT and PEA purchase all energy outputs of the plants up to the maximum defined in the respective PPAs, i.e., 30 MW and 8 MW.

7. Project construction began on 16 August 2010. Plant A was commissioned on 5 August 2011, while Plant B was targeted for commissioning by the end of 2011. However, heavy rains in October 2011 caused severe flooding, particularly in Ayutthaya Province, causing damage to the project. Plant A resumed commercial operations on 2 April 2012 (6 months later) and Plant B started commercial operations on 16 July 2012 (6-month delay from planned commissioning). Fortunately, the project costs were not affected, as both plants were insured for property damage and business interruptions, and BCP received B73 million as insurance indemnity.

## **C. Project Scope and Objectives**

8. The project's stated impacts were the (i) diversification of Thailand's energy mix through the addition of renewable energy capacity, helping the country achieve its target of 20.3% of primary commercial energy coming from alternative energy by 2022; and (ii) demonstrational impact of the feasibility of a private sector solar power generation project.

9. The project's expected outcomes were (i) increased supply of clean energy sourced from solar power, and (ii) reduction of carbon dioxide emissions.

## **D. Major Concerns Raised During Project Processing**

10. The main issues and concerns raised during processing of the project were the disagreement between ORM and PSOD on:

- (i) the borrower's risk rating, and whether the sister company Thai Oil (under parent company PTT group) was an appropriate comparable;
- (ii) the appropriate loan tenor of 15 years considered too long by ORM, while the borrower's parent company PTT and sister company Thai Oil have current funding with longer tenors;
- (iii) the loan pricing at 180 basis point margin considered too low by ORM, albeit being higher than similar loans raised by sister company Thai Oil;
- (iv) the option of including a cash sharing arrangement (cash sweep) above the pre-agreed payout ratio to accelerate amortization, given the large project cash flow generation.

## **E. Major Findings of the Extended Annual Review Report**

11. The Private Sector Operations Department (PSOD) published the extended annual review report (XARR) for the project in September 2016. The XARR gave the project an overall rating of

*successful*, based on component ratings of *excellent* for ADB investment profitability, ADB additionality and ADB work quality, and *satisfactory* for development results.

12. The XARR did not identify any issues. Nonetheless, it highlighted positive lessons that could contribute to the success of future operations, such as (i) selection of financial products that meet the client's funding needs, including long tenor loans in local currency or mobilization of commercial financing through risk participation; (ii) selection of strong sponsors, with strong financials and creditworthiness, sound governance structure and aligned with sustainable development policies; (iii) availability of a stable and transparent regulatory regime, that would ensure future revenues and reduce risks; and (iv) enhanced product design based on lessons learned from other ADB projects.

## F. Objectives and Scope of Evaluation Review

13. **Evaluation Objective.** The main objective of the independent evaluation is to derive lessons from the project, which can then be used to assist in the design and implementation of future ADB private sector operations in the region, particularly investments in similar projects.

14. The output of the evaluation will be a project performance evaluation report (PPER) for the ADB loans to BCP.

15. **Evaluation Scope.** The evaluation will assess the project against the evaluation criteria of development results, ADB profitability, ADB work quality, and ADB additionality in accordance with the Guidelines for Preparing Performance Evaluation Reports on Nonsovereign Operations.<sup>1</sup> The evaluation matrix (presented in Attachment 2) contains the main evaluation questions by criteria and sub criteria for this evaluation and describes the methods to be used in evaluating the performance of the projects and the corresponding sources of information.

16. The evaluation will focus on the following major areas:

- (i) **The project's development results**, including its contribution to private sector development and alignment with ADB strategic development objectives, its economic performance and development impact, its environmental, social, health and safety performance, and its business success.
- (ii) **ADB's additionality.** The PPER will assess whether ADB provided financial and nonfinancial value addition to the project, and contributed to increased private sector participation in clean technology development in Thailand.
- (iii) **ADB's investment profitability.** The PPER will evaluate the net profit contribution of the project to ADB, and comparing the loan pricing with market comparable prices for similar financing products.
- (iv) **ADB's work quality.** The PPER will verify the performance of PSOD in preparing, monitoring, and supervising the project.

17. The evaluation will include the following activities: (i) desk review of all relevant project documents; (ii) gathering and review of secondary data including relevant reports on BPC plant operations or outages; (iii) discussions with project staff from PSOD; (iv) discussions with officials of relevant government offices; (v) meetings with BPC representatives; (vi) meetings with other

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<sup>1</sup> ADB. 2014. *Guidelines for Preparing Performance Evaluation Reports on Nonsovereign Operations*. Manila.

relevant stakeholders; (vii) recalculate the financial and economic rates of return of the project; and (viii) draft and finalize the PPER.

#### **G. Implementation Arrangements and Resource Implications**

18. The evaluation team shall be composed of the following staff and consultants: (i) Alfredo Baño, Evaluation Specialist and Team Leader; (ii) Noel Gamo, Senior Evaluation Officer; (iii) Irene Garganta, Associate Evaluation Analyst; and (iv) an international consultant with expertise in renewable energy in Thailand. The internal peer reviewer will be Kapil Thukral, Principal Evaluation Specialist and an external peer reviewer will be also engaged to review the final report. The time commitment for the PPER will be about 3 months intermittently for the Team Leader and the Senior Evaluation Officer, and approximately 30 working days for the international consultant.

19. The proposed schedule for the PPERs is as follows:

Approval of Evaluation Approach Paper	IV Aug 2017
Recruitment of Consultant	IV Aug 2017
Independent Evaluation Mission	IV Sep 2017
IED Internal Review	III-IV Oct 2017
Interdepartmental Review	I-II Nov 2017
Draft to Editor	III Nov 2017
Submission to Director, IED2	I Dec 2017
Submission to Director General, IED	II Dec 2017

attachments: (i) Basic Data  
(ii) Evaluation Matrix

cc: Director Generals, IED, PSOD; Directors, IETC, PSIF2, PSPM; Advisor, IEOD; N. Gamo, IESP; Project file

**BASIC DATA**  
**Bangchak Solar Power Project (Investment No. 7314-THA)**

<b>Key Project Data (B million)</b>	<b>Per ADB Documents</b>	<b>Actual (XARR data)</b>
Total project cost	4,632.0	4,483.0
ADB loan		
Approved	4,200.0	4,200.0
Committed	4,200.0	4,200.0
Disbursed		3,902.0
Outstanding		3,149.5
Amount of debt cofinancing	3,231.0	3,231.0
Debt-equity ratio at completion	75:25	56:44
<b>Key Dates</b>	<b>Expected</b>	<b>Actual</b>
Screening		Aug 2010
Appraisal		Aug 2010
Preliminary investment negotiations		Aug/Sep 2010
Board approval		05 Oct 2010
Facility agreement signing	2010	12 Oct 2010
Initial disbursement		29 Oct 2010
Final disbursement		31 Oct 2011
Investment project completion	2012	Jan 2012
Extended annual review report	2016	16 Sep 2016

## EVALUATION MATRIX

Evaluation Criteria	Evaluation Questions	Method	Information Source
A. Development Results			
1. Private Sector Development and ADB Strategic Objectives	Did the project contribute to private sector participation in infrastructure projects?	Interview various stakeholders and government officials  Gather secondary data and check whether project contributed to private sector participation in...	PSOD staff, government officials  Government agencies statistics
	How did the project contribute to ADB strategic objectives?	Interview PSOD staff and cross-check project outcomes with ADB strategic objectives	ADB documents
2. Business Success	What was the financial performance of the project and how did this compare with the project's actual funding cost? What is the reason for the lower capex?	Recalculate the FIRR of the project and compare the result to the WACC	Interviews with PSOD staff. Financial statements of BCP. Financial model from XARR
	Did the project contribute to other business goals stated during project approval?	Review approval documents for other business goals which may have been stated and interview various stakeholders to determine if these were achieved	ADB documents; interviews with PSOD staff, government agencies and other stakeholders
	What are the overall prospects for sustainability and growth of the project company or entity?	Interview various stakeholders to get their assessment of the sustainability and growth of the project company's operations. Review annual reports of the borrower.	PSOD staff, BCP management, industry experts, government officials, annual reports

<b>Evaluation Criteria</b>	<b>Evaluation Questions</b>	<b>Method</b>	<b>Information Source</b>
3. Economic Performance	Did the project contribute to economic output and growth?	Recalculate the real EIRR and compare this to hurdle rates defined in the Guidelines.	Financial statements of BCP
	Were the RRP/XARR economic analyses appropriate for the project? Are there economic benefits that were not included?	Revise assumptions and economic model	RRP/XARR economic analyses and assumptions
4. Environment, Social, Health and Safety Performance	Did the project adhere to ADB's policies on environmental, social, health and safety issues?	Review documents and interview various stakeholders to determine if the project complied with ADB's policies.	Project documents such as annual environment and social monitoring reports; and interviews with PSOD, BCP, and civil society
	Were there any positive/negative issues during implementation that need to be highlighted?		
B. ADB Investment Profitability	Was the loan defined at market price? Was the pricing model cleared by ORM?	Calculate gross profit for ADB of the project. Compare loan with market alternatives and review ORM comments at appraisal	PSOD records on disbursements and receipts of cash interest and principal proceeds. Project documents
	What were the factors that contributed to the investment performance or underperformance of the project?	Analyze various factors that affected the project performance such as the economic, political and regulatory environment; Interview various groups; gather secondary data	ADB documents; interviews with PSOD staff, BCP management, industry experts, government officials, and other stakeholders
C. ADB Work Quality			

<b>Evaluation Criteria</b>	<b>Evaluation Questions</b>	<b>Method</b>	<b>Information Source</b>
1. Screening, Appraisal, and Structuring	Did ADB's screening, appraisal, and structuring performance meet high standards of multilateral development banks?	Review projects' processing documents and interview PSOD staff	ADB documents; interviews with PSOD staff
	Why were the 2 loans (Facility A and B) separate, if the project was the same?		
2. Monitoring and Supervision	Did ADB keep itself promptly and fully informed about the project in all material areas and use this knowledge proactively to improve the projects' development outcomes and ADB's investment outcomes?	Review project administration documents, monitoring reports, compliance reports, BTOR and aid memoirs	PSOD documents; interviews with PSOD staff
3. ADB Role and Contribution	What capacity development was provided by the CDTA? How did it improve BCP operations or the Thai solar sector?	Interview various stakeholders	Interviews with PSOD staff, Government, and other stakeholders
D. ADB Additionality	Was ADB financing a necessary condition for the timely realization of the project and other funding mobilization? Why did BCP seek ADB assistance?	Interview various stakeholders	Interviews with PSOD staff, and other investors and stakeholders
	What was ADB's contribution to the design of the project to improve its development impact?		

ADB = Asian Development Bank; BPC = Bangchak Petroleum Public Company Limited; EIRR = economic internal rate of return; FIRR = financial internal rate of return; ORM = Office of Risk Management; PSOD = Private Sector Operations Department; WACC = weighted average cost of capital.

