



Report and Recommendation of the President to the Board of Directors

Project Number: 49263
November 2015

Proposed Loan and Administration of Loan Banchuan Development, Benjarat Development, Nayangklak Development, Nayangklak Wind Power, and Pongnok Development Northeastern Thailand Wind Power Project (Thailand)

This is an abbreviated version of the document approved by ADB's Board of Directors that excludes information that is subject to exceptions to disclosure set forth in ADB's Public Communications Policy 2011.

CURRENCY EQUIVALENTS

(as of 1 November 2015)

Currency unit	–	baht (B)
B1.00	=	\$0.03
\$1.00	=	B35.60

ABBREVIATIONS

ADB	–	Asian Development Bank
CTF	–	Clean Technology Fund
EGAT	–	Electricity Generating Authority of Thailand
EPC	–	engineering-procurement-construction
ha	–	hectare
MW	–	megawatt
O&M	–	operation and maintenance
PPA	–	power purchase agreement
SAA	–	service availability agreement
SPP	–	small power producer

NOTE

In this report, "\$" refers to US dollars.

Vice-President	D. Gupta, Private Sector and Cofinancing Operations
Director General	T. Freeland, Private Sector Operations Department (PSOD)
Director	C. Thieme, Infrastructure Finance Division 2, PSOD
Team leader	R. Lockhart, Investment Specialist, PSOD
Project advisor	D. Wiedmer, Principal Investment Specialist, PSOD
Team members	J. Acharya, Senior Climate Change Specialist, Sustainable Development and Climate Change Department
	I. Aguilar, Safeguards Officer, PSOD
	I. Bryson, Safeguards Specialist, PSOD
	J. Gomez, Safeguards Officer, PSOD
	W. Hong, Investment Specialist, PSOD
	N. Moller, Senior Counsel, Office of the General Counsel (OGC)
	I. McDermid, Counsel, OGC
	K. Paocharoen, Investment Officer, PSOD
	K. Taniguchi, Senior Economist, PSOD

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

CONTENTS

	Page
PROJECT AT A GLANCE	
I. THE PROPOSAL	1
II. THE PROJECT	1
A. Project Identification and Description	1
B. Development Impact, Outcome, and Outputs	2
C. Alignment with ADB Strategy and Operations	3
D. Project Cost and Financing Plan	3
E. Implementation Arrangements	3
F. Projected Financial and Economic Performance	4
III. THE PROPOSED ADB ASSISTANCE	4
A. The Assistance	4
B. Value Added by ADB Assistance	4
C. Risks	5
IV. POLICY COMPLIANCE	5
A. Safeguards and Social Dimensions	5
B. Anticorruption Policy	6
C. Investment Limitations	6
D. Assurances	6
V. RECOMMENDATION	6
APPENDIXES	
1. Design and Monitoring Framework	7

CONFIDENTIAL INFORMATION DELETED

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed local currency loan not exceeding B5,750 million (or its equivalent in US dollars); and (ii) proposed administration of a loan not exceeding the equivalent of \$18,902,000 to be provided by the Clean Technology Fund (CTF)¹ to Banchuan Development, Benjarat Development, Nayangklak Development, Nayangklak Wind Power, and Pongnok Development (collectively the borrowers), for the Northeastern Thailand Wind Power Project in Thailand.²

II. THE PROJECT

A. Project Identification and Description

2. **Project identification.** The 260-megawatt (MW) wind power project aligns with Thailand's energy development plan for 2015–2036 and its goal to generate 30% of its primary energy needs from renewable sources by 2036.³ This would avoid 140 million tons of carbon emissions annually.⁴ Despite strong government commitment to and incentives for renewable energy development since 2010, only 225 MW of wind power capacity had been installed in the country as of July 2015. Major private sector investments are needed if the current plan's target to increase this installed capacity to 3,002 MW by 2036 is to be met. The project is part of the long-term growth strategy of the sponsor, Energy Absolute, which aims to expand its investments in renewable energy generation and become one of the leading alternative energy companies in Southeast Asia.

3. The project is eligible for cofinancing from the CTF.⁵ The CTF provides concessional financing to support the rapid deployment of low-carbon technologies that have good potential to reduce and avoid greenhouse gas emissions over the long term. It is administered by multilateral development banks, including the Asian Development Bank (ADB), and is one of the largest of the funds now helping developing countries finance projects to mitigate climate change. In May 2012, the CTF approved the allocation of \$100 million for a renewable energy program in Thailand.⁶ These funds were to be administered and put to use by ADB within about 3 years.⁷ The project will be the fifth private sector project in Thailand under the program and complete ADB's allocation of the \$100 million in renewable energy financing. CTF support is playing a pivotal role in building critical mass for the first generation of solar and wind power projects in Thailand and will help catalyze self-sustaining long-term private sector investment in the subsector.

4. Thailand generates 70% of its electricity using natural gas and 18% from coal and lignite. Its domestic natural gas resources have long been a reliable source of low-cost energy, but growing demand and dwindling reserves in the Gulf of Thailand mean that it must find new fuels to meet its growing electric power needs. Fortunately, the country has abundant biomass, biogas, mini hydro, solar, and wind resources available for renewable energy development.

¹ Administered by Asian Development Bank.

² The design and monitoring framework is in Appendix 1.

³ Electricity Generating Authority of Thailand. 2015. *Thailand Power Development Plan, 2015–2036*. Bangkok.

⁴ Thailand currently emits more than 215 million tons of carbon emissions annually.

⁵ The CTF is one of the Climate Investment Funds. <http://www.climateinvestmentfunds.org>.

⁶ ADB. 2009. *Establishment of the ADB Clean Technology Fund and the ADB Strategic Climate Fund*. Manila. <http://www-cif.climateinvestmentfunds.org/country/thailand/thailands-ctf-programming>

⁷ The ADB Thailand Private Sector Renewable Energy Program was approved by the CTF Trust Fund Committee on 24 May 2012, pursuant to the financial procedures agreement entered into between ADB and the International Bank for Reconstruction and Development as trustee of the trust fund for the CTF on 18 March 2010.

Making use of these sources can improve Thailand's energy security, save foreign exchange by reducing the need for energy imports, and shield the economy from the impact of global energy price fluctuations.

5. To complement its renewable energy strategy, the Ministry of Energy is encouraging the development of decentralized power generation through a small power producer (SPP) program. The program allows private developers to build, own, and operate renewable energy power projects and enter into power purchase agreements (PPAs) with the Electricity Generating Authority of Thailand (EGAT), which is the state-owned power utility and obligated to buy the electricity that they generate.⁸ Renewable energy SPPs are also eligible for an incentive in the form of a feed-in tariff on top of the wholesale electricity price. Continued government support through the SPP program and this incentive are essential if the project is to be viable and remain sustainable.

6. **Project design.** The project entails the construction and operation of wind power facilities with a total installed power generation capacity of 260 MW in Chaiyaphum Province, about 300 kilometers northeast of Bangkok.

CONFIDENTIAL INFORMATION DELETED

7. **Sponsor.** Energy Absolute was established in 2006 and focuses on solar and wind power generation and biodiesel production and distribution. As of June 2015, the company had four solar power projects in operation with a capacity of 188 MW and one 90 MW project under construction. Its total solar capacity is expected to be 278 MW once construction of that project is completed. The company is also constructing a 126 MW wind farm in southern Thailand with commercial operations expected in the second quarter of 2016. Energy Absolute is listed on the Stock Exchange of Thailand in the market for alternative investments. Its current market capitalization is about \$2.26 billion.⁹ *The European* online magazine named Energy Absolute the renewable energy company of the year in Asia in 2014.¹⁰

CONFIDENTIAL INFORMATION DELETED

8. ADB's review of the borrowers does not give ADB cause to believe that any such entity has been established, or is being used for cross-border tax evasion, money laundering, or terrorism financing in the jurisdictions involved in the project.

B. Development Impact, Outcome, and Outputs

9. **Impact.** The impact of the project will be broader production and consumption of renewable energy and investment in renewable energy from private sector increased. The project will help diversify the country's energy mix by adding renewable energy capacity and help meet the government's long-term clean energy targets (para. 2).¹¹ Thailand is promoting the development of alternative sources of energy, including the use of wind for power generation, as it transitions to a low-carbon economy and seeks to achieve sustainable long-term economic growth. Wind energy is a clean and sustainable source of electricity, and wind

⁸ **CONFIDENTIAL INFORMATION DELETED**

⁹ Bloomberg Professional Service. Energy Absolute Public Company Limited (accessed 22 September 2015).

¹⁰ The European. 2014. Energy Awards 2014. <http://www.the-european.eu/the-european-awards/energy-awards-2014>

¹¹ The government has established clean energy targets of 3,002 MW of wind power by 2036, and 30% of primary commercial energy from renewable sources by 2036.

power development will strengthen Thailand energy security and reduce its reliance on fossil fuels.

10. **Outcome.** The outcome will be the demonstration of the viability and sustainability of a large, utility-scale private sector wind power project in Thailand.

11. **Output.** The output will be the installation and operation of the 260 MW utility-scale wind power project.

C. Alignment with ADB Strategy and Operations

12. **Consistency with ADB Strategy and country strategy.** The project is consistent with ADB's Midterm Review of Strategy 2020.¹² The review reaffirmed ADB's support under Strategy 2020 for development that is environmentally sustainable; the role of the private sector in meeting growing energy demand in the region; and capitalizing on ADB's operating strengths in infrastructure development, finance, and other areas.¹³ The midterm review also supports the expansion of environmentally friendly technologies for clean and efficient energy generation and use, as well as a larger role for private sector financing of infrastructure.

13. **Consistency with sector strategy and relevant ADB operations.** The project is consistent with ADB's country partnership strategy for Thailand for 2013–2016.¹⁴ The country strategy supports three core strategic pillars: knowledge and innovation, private sector development, and regional cooperation and integration. These are to be operationalized in four program areas: (i) infrastructure; (ii) finance sector development; (iii) the environment, including climate change; and (iv) regional cooperation and integration. The government's energy development plan for 2015–2036 notes that private investment in the use of Thailand's wind power potential can reduce the future need for energy imports (footnote 3).

14. The project is consistent with ADB's Energy Policy, which emphasizes investments in energy efficiency, renewable energy projects, and wider access to energy.¹⁵ It will move ADB toward its target of investing \$2 billion a year in clean energy to accelerate low-carbon growth and reduce regional greenhouse gas emissions and closer to the target of ADB's Private Sector Operations Department to make one in four of its projects approved each year a clean energy project.

D. Project Cost and Financing Plan

CONFIDENTIAL INFORMATION DELETED

E. Implementation Arrangements

15. Table 3 summarizes the implementation arrangements.

Table 3: Summary of Implementation Arrangements

Aspects	Arrangements
Regulatory framework	The project is being developed under the government's small power producer program,

¹² ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

¹³ ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

¹⁴ ADB. 2013. *Country Partnership Strategy: Thailand, 2013–2016*. Manila.

¹⁵ ADB. 2009. *Energy Policy*. Manila.

Aspects	Arrangements
	which supports the use of renewable energy from private sector power producers to provide clean electricity to the electricity grid. Wind power projects in Thailand receive a feed-in tariff incentive of B3.5 per kilowatt-hour in addition to the wholesale rate for 10 years from the start of commercial operations.
Management	The project will be developed and managed by Energy Absolute. Energy Absolute is the largest renewable energy company in Thailand and is listed on the Stock Exchange of Thailand. The company currently has 188 MW of solar power plant capacity in operation and 90 MW under construction. It is also building a 126 MW wind power plant, with commercial operations expected in the second quarter of 2016.
Implementation period	CONFIDENTIAL INFORMATION DELETED
Construction arrangements	CONFIDENTIAL INFORMATION DELETED
Supplier/contractor	CONFIDENTIAL INFORMATION DELETED
Operations arrangements	
Revenue structure	EGAT has committed to buying all the electricity generated by the project's 260 MW of installed capacity under standard renewable energy PPAs it has signed with the five borrowers. The PPAs have a 5-year term with automatic 5-year extensions. The borrowers will receive monthly revenue by selling electricity at a rate comprising the average countrywide wholesale tariff and a feed-in tariff incentive of B3.5 per kilowatt-hour. The incentive will end 10 years from the start of commercial operations, after which the companies will receive the wholesale market rate. With their automatic extensions, the terms of the PPAs will at least match the project's economic life and exceed the full term of the debt.
Major cost structure	Wind power has high up-front capital costs and minimal operating costs. The long-term average cost structure is highly predictable. Wind energy is free, and spending on maintenance and replacement of parts is limited. Debt financing is the only material ongoing expense and the dominant factor in determining the economics and viability of wind power projects.
Operation and maintenance	CONFIDENTIAL INFORMATION DELETED
Relevant parties	Power offtake is supported by EGAT, Thailand's state-owned utility.
Performance monitoring	The borrowers will submit semiannual environmental and social monitoring reports to ADB during construction and each year thereafter. The performance indicators are included in the design and monitoring framework (Appendix 1 of the report and recommendation of the President).

ADB = Asian Development Bank, EGAT = Electricity Generating Authority of Thailand, MW = megawatt, PPA = power purchase agreement, Q = quarter.

^a Balance of plant operation and maintenance works include the operation and maintenance of the power transformer, switchgear, cable, electrical equipment, monitoring system, fire alarm, security system, lightning, grounding, and electrical system

Source: Asian Development Bank.

F. Projected Financial and Economic Performance

CONFIDENTIAL INFORMATION DELETED

III. THE PROPOSED ADB ASSISTANCE

A. The Assistance

CONFIDENTIAL INFORMATION DELETED

B. Value Added by ADB Assistance

16. ADB support for the project is justified by the following:

- (i) The longer repayment period allowed by the ADB and CTF loans and the concessional nature of the CTF loan are necessary for the borrowers to have manageable debt service levels over the project life. The project's sustainability depends on the borrowers' ability to amortize the high up-front capital costs over a long period to reduce annual debt service and mitigate the effects of volatility from intermittent revenues. This is especially important in countries where few wind farms are operating and actual performance data is lacking. The financing of wind power plants is still at a nascent stage in Thailand. ADB will help mitigate the risks of wind power development in this project by providing the long loan tenor and the concessional CTF loan and helping to mobilize the local commercial bank financing.
- (ii) Under the ADB Thailand Private Sector Renewable Energy Program, ADB is tasked with identifying eligible clean energy projects and administering the CTF program to support CTF and the government of Thailand's renewable energy targets (para. 3). ADB's CTF program helps bridge the gap in the financing needed for renewable energy projects in developing countries. ADB assistance in administering the CTF program is helping to build critical mass for a first generation of renewable energy projects in Thailand.

C. Risks

CONFIDENTIAL INFORMATION DELETED

IV. POLICY COMPLIANCE

A. Safeguards and Social Dimensions

17. The project is classified as category B for environment, category C for involuntary resettlement, and category C for indigenous peoples under ADB's Safeguard Policy Statement (2009). The project sites are in an agricultural area with marginal land mainly used to grow such cash crops as cassava and corn. The sites are not along a major fly route for migratory birds, and no bat populations are known to exist nearby. Environmental impacts during construction will generally be site-specific and reversible through mitigation measures that can be readily designed and implemented. Potential noise and shadow flicker impacts during operations are expected to be within acceptable limits. Due diligence in September 2015 identified the project's potential environmental and social impacts, and effective measures to avoid, minimize, mitigate, and compensate for the adverse impacts will be incorporated in the safeguard reports and plans. The commitment and institutional capacity of Energy Absolute and the borrowers to manage these impacts are both deemed adequate.

CONFIDENTIAL INFORMATION DELETED

18. The project has been assigned a no-gender-elements category under ADB's Policy on Gender and Development (1998). During construction, about 250 workers will be engaged, mainly as skilled and unskilled laborers. The project will include a grievance redress mechanism to receive complaints and facilitate their resolution in accordance with ADB's Safeguard Policy Statement (2009).

19. The borrowers will comply with national labor laws. Pursuant to ADB's Social Protection Strategy (2001), they will also take measures to comply with the internationally recognized core

labor standards.¹⁶ The borrowers will report regularly to ADB on (i) their compliance and the compliance of the contractors with such laws, and (ii) the measures they take to mitigate safeguard impacts, which will be included in periodic safeguards monitoring reports to be submitted to ADB. Information disclosure and consultations with affected people are being conducted in accordance with ADB requirements.¹⁷

B. Anticorruption Policy

20. Energy Absolute, Banchuan Development, Benjarat Development, Nayangklak Development, Nayangklak Wind Power, and Pongnok Development were advised of ADB's policy of implementing best international practice relating to combating corruption, money laundering, and the financing of terrorism. ADB will ensure that the investment documentation includes appropriate provisions prohibiting corruption, money laundering, and the financing of terrorism, and remedies for ADB in the event of noncompliance.

C. Investment Limitations

21. The proposed ADB loan is within the medium-term, country, industry, group, and single-project exposure limits for nonsovereign investments.

D. Assurances

22. Consistent with the Agreement Establishing the Asian Development Bank (the Charter), ADB will proceed with the proposed assistance upon establishing that the Government of Thailand has no objection to the proposed assistance to Banchuan Development, Benjarat Development, Nayangklak Development, Nayangklak Wind Power, and Pongnok Development.¹⁸ ADB will enter into suitable finance documentation, in form and substance satisfactory to ADB, following approval of the proposed assistance by the ADB Board of Directors.

V. RECOMMENDATION

23. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

- (i) the loan not exceeding B5,750 million (or its equivalent in US dollars) from ADB's ordinary capital resources; and
- (ii) the administration by ADB of the loan not exceeding \$18,902,000, to be provided by the Clean Technology Fund;

to Banchuan Development, Benjarat Development, Nayangklak Development, Nayangklak Wind Power, and Pongnok Development for the Northeastern Thailand Wind Power Project in Thailand, with such terms and conditions as are substantially in accordance with those set forth in this report, and as may be reported to the Board.

Takehiko Nakao
President

16 November 2015

¹⁶ ADB. 2003. *Social Protection*. Manila (adopted in 2001).

¹⁷ **CONFIDENTIAL INFORMATION DELETED**

¹⁸ ADB. 1966. *Agreement Establishing the Asian Development Bank*. Manila.

DESIGN AND MONITORING FRAMEWORK

Impacts the Project is Aligned with			
Production and consumption of renewable energy broadened (EGAT, 2015) ^a			
Investment in renewable energy from private sector increased (EGAT, 2015) ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome Viability and sustainability of a large utility-scale private sector wind power project demonstrated in Thailand	a. 400,000 MW-hours of wind power delivered to the offtaker per annum by 2020 (2015 baseline: Not applicable) CONFIDENTIAL INFORMATION DELETED	a–b. ADB’s annual development effectiveness monitoring reports c–d. Borrower’s annual audited financial statements	The offtaker is unable to comply with its purchase and payment commitments. Wind resources to generate electricity are lower than estimated over the project’s operating life. The government of Thailand no longer supports regulatory policies for the renewable energy sector.
Output 1. 260 MW of utility-scale wind power capacity installed, operational, and transmitting electricity	1a. Wind power facilities (including transmission line and substation) with 260 MW of capacity commissioned by the second quarter of 2018 CONFIDENTIAL INFORMATION DELETED	1a–c. ADB’s annual development effectiveness monitoring reports	Prices of commodities and raw materials needed for wind turbines rise more than budgeted.
Key Activities with Milestones CONFIDENTIAL INFORMATION DELETED			
Inputs Asian Development Bank (loan): B5,750 million Clean Technology Fund (loan): \$18.9 million ^c CONFIDENTIAL INFORMATION DELETED			

Assumptions for Partner Financing

Not applicable

ADB = Asian Development Bank, EGAT= Electricity Generating Authority of Thailand, MW = megawatt.

^a EGAT. 2015. *Thailand Power Development Plan, 2015–2036*. Bangkok.

^b Annual production (megawatt-hours) X emission factor (0.5473 tons of carbon dioxide equivalent per megawatt-hour).

^c Administered by Asian Development Bank

Source: Asian Development Bank.

CONFIDENTIAL INFORMATION DELETED