Report and Recommendation of the President to the Board of Directors

Project Number: 45924
October 2012

Proposed Loan and Administration of Loan
Theppana Wind Farm Company Limited
Theppana Wind Power Project
(Thailand)

In accordance with ADB's public communications policy (PCP), this abbreviated version of the RRP excludes confidential information and ADB's assessment of project or transaction risk as well as other information referred to in paragraph 97 of the PCP.

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 1 October 2012)

Currency unit	–	baht (B)
B1.00	=	$0.03
$1.00	=	B32.00

ABBREVIATIONS

ADB	–	Asian Development Bank
CTF	–	Clean Technology Fund
EGCO	–	Electricity Generating Public Company
EPC	–	engineering, procurement, and construction
kWh	–	kilowatt-hour
MW	–	megawatt
O&M	–	operation and maintenance
PEA	–	Provincial Electricity Authority
PPA	–	power purchase agreement
SPP	–	small power producer
VSPP	–	very small power producer

NOTE

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

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CONTENTS

PROJECT AT A GLANCE

1. Project Name: Theppana Wind Power Project **2. Project Number: 45924**

3. Country: Thailand **4. Department/Division:** Private Sector Operations Department
Private Sector Infrastructure 2

5. Sector Classification:

Sectors	Primary	Subsectors
Energy	√	Renewable energy generation

6.Thematic Classification:

Themes	Primary	Subthemes
Economic growth	√	Fostering physical infrastructure development
Private Sector development	√	Private sector investment

6a. Climate Change Impact:

Adaptation	
Mitigation	√
Not applicable	

6b. Gender Mainstreaming:

Gender equity theme	
Effective gender mainstreaming	
Some gender benefits	
No gender elements	√

7. Targeting Classification:

	Targeted Intervention		
General Intervention	Geographic dimensions of inclusive growth	Millennium development goals	Income poverty at household level
√			

8. Location Impact:

Rural	
Urban	
National	High
Regional	

9. Nonsovereign Operation Risk Rating : NSO7

10. Safeguard Categorization:

Environment	**B**
Involuntary resettlement	**C**
Indigenous peoples	**C**

11. ADB Financing:

Sovereign/Nonsovereign	**Modality**	**Source**	**Amount** ($ million)
Nonsovereign	Project Finance Loan	OCR	B145.2 million

12. Cofinancing:

Financier	**Category**	**Amount**
ADB Clean Technology Fund	Official Loan	$4 million
Local Thailand Commercial Bank	Loan	B145.2 million
Total		**$8.17 million equivalent**

13. Counterpart Financing: Not Applicable

14. Aid Effectiveness: Not Applicable

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed loan not exceeding B145,217,518 or its equivalent in US dollars and (ii) proposed administration of a loan not exceeding $4,000,000 or the equivalent of 20% of project costs, whichever is less, to be provided by the ADB Clean Technology Fund (ADB CTF),[1] both to Theppana Wind Farm Company Limited for the Theppana Wind Power Project in Thailand.[2]

II. THE PROJECT

A. Project Identification and Description

1. Project Identification

2. The 7.5 megawatt (MW) Theppana Wind Power Project is part of the long-term growth strategy of Electricity Generating Public Company (EGCO), which emphasizes expanding investments into renewable energy to strengthen its business in independent power generation in Thailand. With its recent acquisitions and projects currently under development, EGCO plans to increase its installed renewable energy capacity to over 300 MW by 2015.[3] EGCO's strategy aligns with the Renewable and Alternative Energy Development Plan, 2012–2021 approved by the Government of Thailand in December 2011, which increased the target for wind power capacity to 1,200 MW by 2021.[4] As of January 2012, only 7.28 MW of wind power was installed and operating in the country. The plan sets out a target of generating 25% of primary energy from renewable sources by 2021, thereby avoiding 76 million tons of carbon emissions annually. This will be the first Asian Development Bank (ADB) financing of a wind power project in Southeast Asia. It is working with EGCO on this project to establish a financing framework that can be replicated for EGCO's larger 200 MW wind power project planned in 2013.

3. The project is eligible for cofinancing from the ADB CTF.[5] The Clean Technology Fund provides concessional financing to support the rapid deployment of low-carbon technologies with significant potential to reduce and avoid greenhouse gas emissions over the long term. It is administered through multilateral development banks, including ADB, and is one of the largest funds helping developing countries fill gaps in financing projects to mitigate climate change. The CTF Trust Fund Committee approved the allocation of $99.5 million for the CTF Thailand Private Sector Renewable Energy Program on 24 May 2012, to be utilized and administered by ADB.[6] The proposed project is the second private sector project in Thailand[7] under the ADB CTF[8] (approved and under due diligence), for a total allocation of $19 million to date.

4. As of June 2012, Thailand's installed power generation capacity was 31,525 MW. The country's electricity production depends heavily on conventional fuels, with 65% produced using

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1 Financed by the Clean Technology Fund.
2 The design and monitoring framework is in Appendix 1.
3 EGCO's currently operating installed capacity for renewable energy includes 9.9 MW generated from biomass and 63 MW of solar.
4 The original target for wind power was set at 800 MW in 2007.
5 Climate Investment Funds. http://www.climateinvestmentfunds.org.
6 ADB Thailand Private Sector Renewable Energy Program approved by 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 Clean Technology Fund dated 18 March 2010.
7 The first private sector project identified under the ADB CTF is the Provincial Solar Power Project.
8 ADB. 2009. *Establishment of the ADB Clean Technology Fund and the ADB Strategic Climate Fund*. Manila

natural gas and 20% coal and lignite. Natural gas has traditionally provided Thailand with a reliable and low-cost source of energy, but growing demand and dwindling natural gas reserves from the Gulf of Thailand mean the country must diversify and secure alternative fuel sources for power generation. Fortunately, Thailand has abundant renewable energy sources—biomass, biogas, mini-hydro, solar, and wind. Using these domestic sources of renewable energy can boost Thailand's energy security, save foreign exchange, and protect the country from global price fluctuations.

5. To complement its renewable energy strategy, the Ministry of Energy advocates decentralized power generation mainly by supporting the country's small power producer (SPP) and very small power producer (VSPP) programs. The SPP program allows private developers to build, own, and operate 10–90 MW power projects and enter into power purchase agreements (PPAs) with the Electricity Generating Authority of Thailand (EGAT). Under the VSPP program, producers of up to 10 MW may sell power to the Metropolitan Electricity Authority (MEA) or the Provincial Electricity Authority (PEA). Renewable energy SPPs and VSPPs are eligible for a feed-in tariff (or "adder") in addition to the wholesale electricity price. As of March 2012, only three wind power VSPPs were connected to the grid, with a combined capacity of 0.380 MW.

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2. The Borrower and Sponsors

6. The borrower is Theppana Wind Farm Company, a special purpose project company 90% owned by EGCO and 10% owned by the founder of Pro Ventum, an international wind power developer based in Germany.[9]

7. EGCO is Thailand's first independent power producer and currently the second largest private power producer in the country. It was privatized by EGAT in 1992 and listed on the Stock Exchange of Thailand in 1995. EGCO is owned by EGAT (25.4%), TEPDIA Generating (23.9%), and the public (50.7%).[10]

8. The Pro Ventum Group is a German company founded in 1996 to develop wind power projects in Europe. The Pro Ventum Group expanded into Asia and the Pacific in 2001 and into Thailand in 2007. It has successfully developed 12 wind power projects in Australia, Germany, and Ireland with capacity ranging from 1.2 MW to 232 MW. With its expertise in planning, developing, constructing, and operating wind farms, the Pro Ventum Group contributes early stage site development to the partnership.[11]

[9] The 10% is divided among Pro Ventum International (0.19%), Prograce Asia (8.81%), and J.R. Management Company (1%), all owned by R. Zoller, the founder of Pro Ventum.
[10] TEPDIA Generating is jointly owned 50% by Mitsubishi and Tokyo Electric Power Company.
[11] Implementation Arrangements (accessible from the list of linked documents in Appendix 2).

B. Development Impact, Outcome, and Outputs

1. Impact

9. The impact of the project will be to diversify Thailand's energy mix by adding renewable energy capacity, thus helping the country progress toward its clean energy targets.[12] To achieve sustainable long-term economic growth, Thailand is promoting alternative sources of energy such as wind for power generation and is beginning its transition to a low-carbon economy. Wind energy is a clean and sustainable source of electricity that diversifies the country's energy mix, strengthening energy security and reducing reliance on fossil fuel.

10. The project also contributes to accelerating and expanding private investment in clean energy infrastructure in Thailand. It is expected that successful project implementation and viable returns will attract other private investors to wind energy projects.

2. Outcome

11. The outcome will be the demonstrated viability and sustainability of a utility-scale wind project in the private sector..

3. Outputs

12. The output will be the installation and operation of the 7.5 MW wind power plant.

C. Alignment with ADB Strategy and Operations

1. Consistency with Strategy 2020 and Country Strategy

13. ADB's Strategy 2020 supports development that is environmentally sustainable and recognizes the role of the private sector to meet growing energy demand in the region, capitalizing on ADB's operating strengths in infrastructure development, finance, and other areas.[13] The strategy supports expanding environment-friendly technologies for clean and efficient energy generation and use, as well as a larger role for the private sector financing of infrastructure through public–private partnership. The project is consistent with the above.

2. Consistency with the Country Strategy

14. ADB's country partnership strategy, 2007–2011 for Thailand has three core strategic areas: infrastructure, environmental sustainability, and capital markets.[14] The project is consistent with this strategy. The government's Alternative Energy Development Plan, 2012–2021 notes the immense potential of wind power in Thailand and that energy imports can be avoided through its use with private investment. The project supports the government's long-

[12] The government has established clean energy targets of 1,200 MW of wind power by 2021 and 25% of primary commercial energy from renewable sources by 2021.

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

[14] ADB. 2007. *Country Partnership Strategy: Thailand, 2007–2011.* Manila. ADB is working with the Government of Thailand to prepare a new country partnership strategy, 2012–2016, which will align with the 11th National Economic and Social Development Plan, 2012–2016.

term objective for the Thailand Clean Technology Fund Investment Plan to use CTF resources to support renewable energy projects in the private sector.[15]

3. Consistency with the Energy Policy

15. The project is consistent with ADB's Energy Policy, which emphasizes investments in energy efficiency, renewable energy projects, and wider access to energy.[16] It advances ADB's target of investing $2 billion per year in clean energy by 2013 to accelerate low-carbon growth and reduce regional greenhouse gas emissions, as well as the target of the Private Sector Operations Department to receive 25% of its annual approvals, by numbers, for clean energy projects. Further, it will support ADB's target of installing 1 gigawatt of wind power by 2015 under its Quantum Leap in Wind initiative.

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D. Implementation Arrangements

16. Table 3 summarizes the implementation arrangements.[19]

Table 3: Summary of Implementation Arrangements

Aspects	Arrangements
Regulatory framework	The project is being developed as a public–private partnership under Thailand's very small power producer program, which uses renewable energy from private sector power plants with capacity of up to 10 MW to provide clean electricity to the grid.
Management	The project will be developed and managed by Theppana, a special-purpose company incorporated in Thailand that is 90% owned by EGCO, which is Thailand's first independent power producer and now the second largest private power producer in the country. It is listed on the Stock Exchange of Thailand.
Implementation period	Q4 2012–Q3 2013, for a construction period of 12 months
Construction arrangements	The project will be constructed under a fixed-price, date-certain, turnkey EPC arrangement covering all design, engineering, supply, construction, testing, and commissioning.
Supplier/Contractor	Goldwind International Holdings (Hong Kong) is the supplier of Goldwind turbines. Goldwind is listed on the Shenzhen Stock Exchange and the Hong Kong Stock Exchange. It is the third largest wind turbine manufacturer in the world, with an 8.7% market share and an accumulated capacity of over 13 gigawatts from over 11,000 wind turbines installed worldwide. Goldwind has the longest track record in wind turbine manufacturing in the People's Republic of China and is the global leader in direct-drive permanent magnet technology. Italthai Engineering Company is a related company of Italian–Thai Development Public Company (ITD), which specializes in utility engineering for power plants and high voltage electrical power substation projects. ITD is Thailand's largest construction contractor and is listed on the Stock Exchange of Thailand. It has more than 50 years of experience in construction and a strong track record in construction projects for private clients and government authorities such as EGAT, MEA, and PEA.

[15] The CTF provides scaled-up financing to demonstrate, deploy, and transfer low-carbon technologies with significant potential to avoid greenhouse gas emissions over the long term. The CTF is part of the Climate Investment Funds implemented by multilateral development banks to bridge the financing and learning gap until the next international climate change agreement.
[16] ADB. 2009. *Energy Policy.* Manila.
[19] Details of Implementation Arrangements (accessible from the list of linked documents in Appendix 2.)

Aspects	Arrangements
Operations arrangements	
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Major cost structure	Wind power has relatively high upfront capital costs and minimal operating costs. The long-term average cost structure is highly predictable, with limited expenditure on maintenance and parts replacement and no ongoing fuel expense. As debt financing is the only material expense, it drives the economics and viability of wind power projects.
Operation and maintenance	O&M for wind power is relatively simple, consisting of remote monitoring, regular inspections, minor repairs, parts replacement, and measurement and data verification. O&M will be undertaken by Theppana with an option to outsource them to Goldwind for the first 5 years after commencing commercial operations.
Relevant parties	Revenue offtake is supported by PEA, Thailand's state-owned distribution utility responsible for all distribution and retail electricity sales outside the Greater Bangkok area.
Performance monitoring	Theppana will submit quarterly unaudited financial statements, annual audited financial statements, and semiannual environmental and social monitoring reports to ADB during construction, annual thereafter. The performance indicators are included in the design and monitoring framework (Appendix 1).

ADB = Asian Development Bank, EGAT = Electricity Generating Authority of Thailand, EGCO = Electricity Generating Public Company, EPC = engineering, procurement, and construction, ITD = Italian–Thai Development Public Company, MEA = Metropolitan Electricity Authority, MW = megawatt, O&M = operation and maintenance, PEA = Provincial Electricity Authority, PPA = power purchase agreement.
Source: Asian Development Bank.

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III. THE PROPOSED ADB ASSISTANCE

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IV. POLICY COMPLIANCE

A. Safeguards and Social Dimensions

17. The project is category B for environment. In compliance with ADB's Safeguard Policy Statement (2009), an initial environmental examination was carried out. The project site and its immediate vicinity do not support natural vegetation of ecological significance. The site does not provide important habitat to any terrestrial birds, nor is located along the route of migratory birds. The potential environmental and social impacts of the project have been identified, and effective measures to avoid, minimize, and mitigate them are outlined in the environmental management plan. Impacts during construction are short term and will be readily mitigated. During operation, predicted noise and shadow flicker effects will be studied, confirmed, and monitored. Theppana is committed to hiring qualified staff to implement the plan including the

conduct of regular O&M in partnership with Goldwind.[25] The cost of mitigation measures is included in project design and overall project cost. The monitoring program will keep track of noise, shadow flicker frequency, bird and bat injury or mortality, complaints received, and incidents or accidents. Theppana will submit an annual environmental monitoring report to ADB.

18. The project is category C for involuntary resettlement and indigenous peoples. Theppana entered into lease agreements for land under the Agricultural Land Reform Office, where the wind turbines, substation, and green area will be located, and for Nor Sor 3 Gor[26] land that will be used for the access road. The lease agreement with the Agricultural Land Reform Office includes consent signed by farmers who will yield portions of the land they farmed. These agreements were based on negotiation and the agreed compensation package.[27] No land acquisition is required for the transmission line, as Theppana will upgrade PEA's existing transmission line. There are no indigenous peoples at the project site.

19. During construction, 250 workers will be engaged, mainly as skilled and unskilled laborers. Theppana and its contractors will comply with ADB's Social Protection Strategy and report annually to ADB on their compliance with national labor laws and internationally recognized core labor standards.[28] Stakeholders, including communities in the vicinity of the project, were informed and consulted about the project. The project is categorized as having no gender element, given its limited potential for gender-inclusive design.[29] Although the project has no employment target for women, the sponsor adheres to the principle that there will be no discrimination in recruiting project workers during construction or operation. Sex-disaggregated employment data will be collected from Theppana. The company has committed to establishing a grievance redress mechanism to receive complaints and facilitate their resolution.

B. Anticorruption Policy

20. Theppana was 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,[30] the Government of Thailand will be requested to confirm that it has no objection to the proposed

[25] O&M services will be undertaken by Theppana with an option to outsource them to Goldwind for the first 5 years after commencing commercial operations. O&M will include regular inspections, minor repairs, parts replacement, and measurement and data verification.
[26] Nor Sor 3 Gor is a certificate issued by the relevant land authority certifying the usage of the land by the holder.
[27] The lease price is fair and constitutes replacement cost. Negotiations were open and addressed information and bargaining power asymmetry in accordance with the ADB Safeguard Policy Statement (2009).
[28] ADB. 2003. *Social Protection Strategy.* Manila (adopted in 2001).
[29] Summary Poverty Reduction and Social Strategy, and Safeguards and Social Dimensions Summary (accessible from the list of linked documents in Appendix 2).
[30] ADB. 1966. *Agreement Establishing the Asian Development Bank*. Manila.

assistance to Theppana. ADB will enter into suitable finance documentation, in form and substance satisfactory to ADB, following approval of the proposed assistance by the 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, acting in the absence of the President, under the provisions of Article 35.1 of the Articles of Agreement of ADB, I recommend that the Board approve

(i) the loan not exceeding B145,217,518 or its equivalent in US dollars to Theppana Wind Farm Company Limited for the Theppana Wind Power Project in Thailand from ADB's ordinary capital resources; and

(ii) the administration by ADB of the loan not exceeding $4,000,000 or the equivalent of 20% of project costs, whichever is less, to Theppana Wind Farm Company Limited for the Theppana Wind Power Project in Thailand to be provided by the ADB Clean Technology Fund;

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.

Bindu Lohani
Vice-President

30 October 2012

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and/or Indicators with Baselines	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Impact			**Assumptions**
Diversified energy mix through the addition of renewable energy capacity	1,200 MW of new wind power capacity by 2021 [31] to help meet Thailand's target of 25% of primary commercial energy from renewable energy	Statistics and information disclosed by the Ministry of Energy	Stable and consistent regulatory policies for the renewable energy sector Viable tariffs for wind power **Risk** Demand from PEA lower than expected
Increased private sector participation in wind power production	At least 10 other private sector-owned utility-scale wind power generators installed by 2021	Statistics and information disclosed by the Ministry of Energy	
Outcome			**Assumptions**
Demonstrated viability and sustainability of utility-scale private sector wind farm	More than 10,000[32] megawatt-hours of wind power delivered to the offtaker per annum, on average, during the first 10 years of operation (2013–2023)	Theppana annual technical reports	Plant achieving forecasted availability Offtaker complying with its purchase and payment commitments Viable tariff rates for wind power over the operating life of the project **Risks** Deficient operation and maintenance Lower-than-estimated wind resource over the operational life of the project
	At least 7000 tons of carbon dioxide equivalent emissions avoided per annum, on average, during the first 10 years of operation (2013–2023)	Theppana annual technical reports	
	Project financial internal rate of return exceeds the weighted average cost of capital of 3.2% at project completion	Theppana audited financial statements and technical reports	
	Project economic internal rate of return exceeds 10% at project completion	Theppana technical and operations reports	

[31] The government has established clean energy targets of 1,200 MW of wind power by 2021 and 25% of primary commercial energy from renewable sources by 2021.

[32] See para. 23 for technical assumptions regarding wind availability.

Design Summary	Performance Targets and/or Indicators with Baselines	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Outputs Installation and operation of 7.5 MW utility-scale wind power plant	7.5 MW wind power capacity commissioned by the third quarter of 2013 Over 250 persons (45 persons ;full time equivalent) employed during construction Local purchase of goods and services amounting to over B38.3 million during construction	Theppana annual technical reports Sex-disaggregated employment data collected from Theppana Audited Financial Statements and operational reports	**Assumptions** Project agreements adhered to as agreed by third parties **Risk** Delayed commissioning of wind power plant
Activities with Milestones 1.1 Construction work in progress, as scheduled 1.2 Loan agreement signed by fourth quarter of 2012 1.3 Commissioning of project by third quarter of 2013			**Inputs** ADB: B145.2 million ($4.54 million) ADB Clean Technology Fund: B116.2 million ($3.63 million) CONFIDENTIAL INFORMATION DELETED

ADB = Asian Development Bank, MW = megawatt, PEA = Provincial Electricity Authority.

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