Report and Recommendation of the President to the Board of Directors

Project Number: 50371-001
November 2017

Proposed Loan
China Everbright International Limited
Municipal Waste-to-Energy Project (Viet Nam)

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.

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 30 October 2017)

Currency unit	–	dong (D)
D1.00	=	$0.000044
$1.00	=	D22,715

Currency unit	–	Hong Kong dollar/s (HK$)
HK$1.00	=	$0.1282
$1.00	=	HK$7.8024

Currency unit	–	yuan (CNY)
CNY1.00	=	$0.1506
$1.00	=	CNY6.6419

ABBREVIATIONS

ADB	–	Asian Development Bank
CEIL	–	China Everbright International Limited
CH_4	–	methane
EVN	–	Vietnam Electricity
EU	–	European Union
FIT	–	feed-in tariff
GHG	–	greenhouse gas emission
MSW	–	municipal solid waste
MW	–	megawatt
PPA	–	power purchase agreement
PPP	–	public–private partnership
PRC	–	People's Republic of China
tCO2e	–	ton of carbon dioxide equivalent
WTE	–	waste-to-energy

NOTES

(i) The fiscal year (FY) of China Everbright International Limited ends on 31 December.

(ii) In this report, "$" refers to United States dollars unless otherwise stated.

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I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan of up to $100,000,000 to China Everbright International Limited (CEIL) for the Municipal Waste-to-Energy Project in Viet Nam.

II. THE PROJECT

A. Project Identification and Description

2. **Project identification.** Rapid urbanization, coupled with population growth, has led to municipal solid waste (MSW) generation in Viet Nam increasing to unmanageable levels. During 2004–2015, waste generation increased by about 78.2% from 15.6 million tons per year to about 27.8 million tons per year. A significant portion of the waste collected is disposed of in landfills within 200–500 meters of residential areas. Less than 30% of those sites are classified engineered or sanitary landfills. This poses a grave threat to public health in areas with high waste generation because of the contamination of ground and surface water from untreated leachate; emissions of airborne pollutants; and the spread of flies, mosquitoes, rodents, and dust.

3. To address the increasing problems of MSW management, the Government of Viet Nam issued several laws and regulations calling for an immediate attention to the management and disposal of waste in an environmentally sustainable manner. Waste-to-energy (WTE) was recognized as an effective method to reduce the waste volume by 90% and eliminate methane (CH_4) emissions. WTE technologies use the waste heat from incineration to produce electricity and heat. By replacing fossil fuel combustion and avoiding CH_4, WTE technologies reduce greenhouse gas (GHG) emissions and mitigate climate change. In 2014, the Prime Minister issued a directive to encourage private sector investments in WTE projects—to manage the increasing volume of solid waste and help address the country's electricity requirements. The directive includes a feed-in tariff (FIT) equivalent to $0.1005 per kilowatt-hour.

4. Despite the recent policy shift in favor of WTE and the increased interest of municipal governments in clean technologies, market barriers still limit private sector participation in WTE. To date, only one plant, supported by technical assistance funds and grants, has been built with a capacity to treat 75 tons of industrial waste per day and a power generation capacity of 1.93 megawatts (MW).[1] Key bottlenecks include lack of an effective public–private risk allocation and lack of access to long-term finance.

5. Through ongoing discussions with stakeholders, the project team identified that CEIL possess a desirable business model that can leverage its operational experience with clean technologies to pursue new ventures in municipal-level PPP projects in Viet Nam, which are smaller than the central government-led public-private partnership (PPP) projects and more difficult to attract private sector participation. CEIL can effectively burn MSW with high water content in Viet Nam without supplemental fuel (such as coal), and can enter into a municipal PPP arrangement without a sovereign guarantee.

6. **Project design.** The project, through a portfolio approach, will support the construction and operation of a series of WTE plants with advanced clean technologies, including flue gas emission control to meet European Union (EU) standards, in multiple municipalities. Each WTE

[1] Nam Son Waste Treatment Complex in Soc Son District, Ha Noi developed by the New Energy and Industrial Technology Development Organization of Japan.

plant will treat MSW and supply electricity to the local grid. Each plant incinerates MSW, recovers waste heat for power generation, purifies waste gas, and treats leachate. Under the project, CEIL aims to develop and invest in WTE subprojects to treat 7,500 tons of MSW daily in Viet Nam. CEIL is developing subprojects in primary and secondary cities in the Mekong Delta and northern Viet Nam. This project will be the first municipal WTE project financed entirely by the private sector.

7. **Borrower.** Since its establishment in 1993, CEIL has become a leading integrated environmental protection company in the People's Republic of China (PRC). Following the Government of the PRC's policy to introduce private sector participation in the environment sector in 2003, CEIL focused on WTE, wastewater management, and renewable energy businesses. CEIL has distinguished itself from its peers by implementing higher environmental standards such as the EU2010 Standard.[2] In recognition of CEIL's environmentally sustainable operations, it has recently been included in the FTSE4 Good Index and the Dow Jones Sustainability World Index[3] based on compliance with global standards on environment, social, and governance practices.

8. One of the key technical challenges of WTE in Viet Nam is a low net calorific value of MSW with high water content—estimated at 3,600–7,900 kilojoules per kilogram, which is much lower than the calorific value of MSW in developed countries (8,400–17,000 kilojoules per kilogram). CEIL has been addressing low calorific MSW in smaller cities and islands in the PRC through improved design and operational expertise.

9. At the end of June 2017, CEIL had 32 WTE subprojects in operation with a combined processing capacity of 28,300 tons per day and generation capacity of about 1,500 gigawatt-hours a year. For the 6 months ended in June 2017, CEIL reported consolidated revenue of HK$9.1 billion ($1.2 billion) and profit attributable to equity holders of HK$1.8 billion ($0.2 billion). This represents an increase of 69% in revenue and 49% in profit attributable to equity holders compared with the same period in 2016. CEIL's consolidated total assets was HK$61.9 billion ($7.9 billion) and consolidated total equity was HK$25.5 billion ($3.3 billion) at the end of June 2017. Listed on the main board of the Hong Kong Stock Exchange, CEIL has a market capitalization as of 30 October 2017 of HK$48.7 billion ($6.2 billion).

B. Development Impacts, Outcome, and Outputs

10. **Impacts.** The project is aligned with the following impacts: increased use of solid waste for power generation as part of the country's solid waste management strategy,[4] and increased share of biomass-based power plants, which include WTE facilities, to account for about 2.1% of the country's total installed capacity by 2030.[5]

11. **Outcome.** The project will have the following outcome: MSW treated and energy produced from environmentally sustainable WTE plants in Viet Nam.[6] By 2028, 2.5 million tons of MSW will

[2] Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control). 24 November 2010.
[3] CEIL was included in the Dow Jones Sustainability World Index for two consecutive years (2016–2017).
[4] Ministry of Construction and Ministry of Natural Resources and Environment of Viet Nam. 2009. *The National Strategy for Integrated Management of Solid Waste up to 2025 with a Vision to 2050*. Ha Noi.
[5] Government of Viet Nam. 2016. *National Power Development Plan VII for the period of 2016 – 2020 with the vision to 2030.* Ha Noi.
[6] The design and monitoring framework is in Appendix 1.

be treated, 790 gigawatt-hours of electricity will be generated, and about 787,300 tons of carbon dioxide equivalent (tCO2e)[7] emissions will be avoided on average per year.

12. **Outputs.** The outputs will be the construction of WTE plants across Viet Nam; growth of local economy; and generation of employment. WTE subprojects will be developed with the capacity to treat 7,500 tons of MSW per day; and an installed capacity of 110 MW of electricity by 2022. The facilities will comply with ADB safeguard requirements and technical and financial eligibility criteria. During the construction period (2018-2021), roughly $250 million of goods and services will be procured from the local economy, and about 1,500 jobs created.

C. Alignment with ADB Strategy and Operations

13. **Consistency with ADB strategy and country strategy**. ADB's Midterm Review of Strategy 2020 outlined 10 strategic priorities of ADB operations to address the development challenges in Asia and the Pacific. The project supports three of those priorities: (i) environment and climate change, (ii) infrastructure development, and (iii) private sector development and operations.[8] The project is the country's first PPP in municipal environmental infrastructure.

14. ADB's country partnership strategy for Viet Nam, 2016–2020 aims to foster inclusive and environmentally sustainable growth. The project is aligned with two of the three pillars of the strategy: (i) increasing the inclusiveness of infrastructure and service delivery, and (ii) improving environmental sustainability and climate change response. Under the strategy, ADB will increase the focus on wastewater and solid waste management, including through PPP, to promote inclusive urbanization.[9]

15. **Consistency with sector strategy and relevant ADB operations**. The project aligns with ADB's energy policy, which encourages interventions designed to shift reliance on fossil fuel sources for energy to renewable forms of energy to slow down the growth of GHG emissions and help countries achieve energy self-sufficiency.[10] The project will mitigate GHGs by replacing coal with MSW in power generation and through the avoidance of CH_4 from landfills. The project is also aligned with Viet Nam's commitments to the United Nations Framework Convention on Climate Change, and will contribute to ADB's target of providing $6.0 billion per year in climate finance by 2020.

16. **Lessons from previous operations.** The design of the project in Viet Nam took careful consideration of the experience from previous WTE projects. ADB supported municipal and agricultural WTE projects in the PRC in 2009 and 2012.[11] ADB's portfolio approach has also facilitated the financing of multiple subprojects too small to be financed alone. This has contributed to PPP developments in municipal environmental infrastructure and has mitigated GHG emissions effectively. The first project was rated as *satisfactory* based on four criteria: (i) its

[7] A carbon footprint is measured based on tCO2e. This allows for the different GHGs (i.e., carbon dioxide, CH_4, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride) to be compared on a like-for-like basis relative to one unit of carbon dioxide.

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

[9] ADB. 2016. *Country Partnership Strategy: Viet Nam, 2016–2020—Fostering More Inclusive and Environmentally Sustainable Growth*. Manila.

[10] ADB. 2009. *Energy Policy*. Manila.

[11] ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance for the Municipal Waste to Energy Project in the People's Republic of China*. Manila; ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loans to China Everbright International Limited for the Agricultural and Municipal Waste to Energy Project in the People's Republic of China*. Manila.

contributions to private sector development and ADB's strategic development objectives; (ii) economic performance; (iii) environmental, social, health, and safety performance; and (iv) business success of the project.[12] After strengthening the safeguard management system, ADB supported the renewable energy segment of CEIL in accessing the international capital market to diversify ownership and enhance transparency.[13]

17. ADB has also provided substantial support to the PPP enabling environment in Viet Nam, although the actual investment in PPP projects has been limited until now.[14] The last major private foreign-invested PPP project was in 2002. The key issues that have impeded investments include (i) transparency in regulations and implementation, (ii) risk allocation between the public and private sectors, (iii) land use rights, (iv) cost-recovery tariffs, and (v) availability of long-term debt. While a new PPP law was issued in April 2015 to encourage private sector investments, private sector participation in infrastructure is still nascent.

D. Implementation Arrangements

18. Table 2 summarizes the implementation arrangements.

Table 2: Summary of Implementation Arrangements

Aspects	Arrangements
Regulatory framework	Decree 59 outlines the general principles of MSW management to be adopted throughout the country. The operation of WTE facilities are considered a solid waste disposal activity that is covered by the decree. MSW management activities will be supported by state budgets unless a separate financing is specifically provided for under this decree. Circular 121 outlines the various fiscal and non-fiscal incentives available for investors engaged in MSW management activities. Decision 2149 sets the national targets for MSW management activities for the years 2020 and 2025. Decision 31 provides for specific incentives for WTE projects to encourage investments in the sector.
Management	CEIL sets up subproject companies to construct, own, and operate WTE plant in each city. CEIL will control, manage, and provide management and operational oversight to each subproject company as the largest shareholder.
Implementation period	January 2018–December 2021
Operations arrangements	
Revenue structure	Each subproject will have two revenue streams. Power generation. Each subproject company will sell electricity to Vietnam Electricity under a 20-year power purchase agreement. Power sold under the power purchase agreement will be paid at a feed-in tariff of D2,114 per kilowatt-hour (equivalent to $0.1005 per kilowatt-hour). The law provides for periodic adjustments for fluctuations in foreign exchange, though the mechanism for such adjustment needs to be clarified. Under the law, all power generated and delivered to the metering point by the subproject companies will be taken by Vietnam Electricity. Waste treatment. Each subproject company will enter a service agreement with the authorized local state agency for processing MSW. Waste treatment fees will be determined, based either on a competitive bidding process to be conducted by the local government or through negotiations.

[12] ADB. 2015. *Extended Annual Review Report: Loan for the Municipal Waste to Energy Project in the People's Republic of China*. Manila.

[13] ADB. 2017. *FAST Report: Equity Investment to China Everbright Greentech Limited for the China Everbright Renewable Energy Project in the People's Republic of China*. Manila.

[14] ADB. 2013. *Report and Recommendations of the President to the Board of Directors: Public Private Partnership Support Project*. Manila. ADB. 2012. *Technical Assistance on Developing Government Support and Risk Management Systems for Public–Private Partnerships in Southeast Asia*. Manila. ADB. 2010. *Technical Assistance on Support for Public-Private Partnership (PPP) in Viet Nam*. Manila.

Aspects	Arrangements
Operation and maintenance	The Vietnamese Labor Code allows each subproject company to hire foreign employees directly for jobs as managers, executives, experts, and technicians if Vietnamese employees are not able to satisfy the business requirements.
Relevant parties	Procurement for spare parts and inventory will follow CEIL's centralized procurement policy, which requires a competitive bidding process. Only suppliers that have been assessed to have a good record of performance, financial capacity, and governance, among others, will be invited to bid.

ADB = Asian Development Bank, CEIL = China Everbright International Limited, MSW = municipal solid waste, WTE = waste-to-energy.
Source: ADB.

III. THE PROPOSED ADB ASSISTANCE

A. The Assistance

19. The ADB assistance is a direct loan of up to $100 million. The direct loan will be provided from ADB's ordinary capital resources.

B. Value Added by ADB Assistance

20. There is an increasing demand from the market for ADB to support decentralized PPPs to deliver much needed municipal infrastructure in Viet Nam. The project is designed to provide financing support for multiple WTE subprojects that are often too small, too costly to finance and time-consuming for ADB or international banks to finance on a stand-alone basis. As one of the first municipal level PPPs, the project features a strong model for private sector participation. This encourages, with multi-faceted demonstration effects, the private sector to invest in WTE projects beyond immediate project interventions. First, the project will support the transfer of technology and technical expertise to effectively address urban waste management problems effectively. Second, it will encourage other private sector participants to invest in WTE projects using clean technologies. Third, the project will demonstrate a new mechanism to provide a long-term, reliable solution to address MSW problems, which is applicable to other primary and secondary municipalities across Viet Nam.

IV. POLICY COMPLIANCE

A. Safeguards and Social Dimensions

21. In compliance with ADB's Safeguard Policy Statement (2009), the project is classified as category B for environment, category B for involuntary resettlement, and category C for indigenous peoples. As the proposed ADB investment is not earmarked for any specific subprojects, the requirement for general corporate finance projects will apply. A qualified and experienced external expert conducted a corporate audit of CEIL's environmental, health, safety, and social policies, procedures, and operations. The audit recommended corrective actions to ensure that procedures and operations across all subproject business activities are adequate and comply with national laws, ADB's Safeguard Policy Statement, and other social requirements. Following recommended corrective actions, CEIL will update its corporate environmental and social management systems satisfactory to ADB such that it is applicable to the company's operations in Viet Nam before the first disbursement for the financing of the subprojects. The institutional capacity and commitment of CEIL to manage the project's social and environmental impacts are deemed adequate.

22. 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 can be well mitigated as incorporated in the safeguard reports and plans to be prepared by CEIL to meet national and international requirements and ADB's Safeguard Policy Statement. CEIL has proven capacity to identify, mitigate, and manage the environmental and social impacts and risks associated with its subprojects in the PRC; and will ensure this capacity is in place in Viet Nam. ADB will ensure that CEIL employs rigorous subproject screening and categorization procedures to all identified subprojects to ensure that classification is in accordance with ADB categorization requirements and processed in accordance with Safeguard Requirements 1–3 before ADB funding. CEIL will report annually to ADB on its subproject portfolio environmental and social management systems' performance and semiannually for WTE subprojects as required.

23. CEIL will comply with national labor laws and, pursuant to ADB's Social Protection Strategy (2001), will take measures to comply with internationally recognized core labor standards.[15] CEIL will report regularly to ADB on (i) compliance with such laws, and (ii) the measures taken. Information disclosure and consultation with affected people will be conducted in accordance with ADB requirements.

24. CEIL follows the Global Reporting Initiative Sustainability Reporting Standards[16], and its annual report includes gender-disaggregated data from its subsidiaries. CEIL's 2016 Sustainability Report notes that males dominate the energy and engineering sector. The company, nevertheless, pays attention to equal opportunity in employment and remuneration. CEIL safeguards rights enshrined in laws in the PRC that protect maternity and paternity leave, anti-discrimination, and unfair dismissal. About 24% of CEIL employees are women. In 2016, 14% of senior management were women while 28% of middle management were women. The remuneration ratio between female and male employees at senior management level was 1.08, but drops to 0.90 at middle management level. Women on average undertook 11.5 more hours of training per year than men in 2016. CEIL's performance indicates that it promotes gender equality and women's empowerment in its subsidiary operations. The Human Resources Department at the CEIL corporate level and at the subproject level in Viet Nam is responsible for ensuring gender equality in operations. In Viet Nam, each subproject is required to follow the Law on Gender Equality (No. 73/2006/QH11).

B. Anticorruption Policy

25. CEIL 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

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

[15] ADB. 2003. *Social Protection.* Manila (adopted in 2001).
[16] www.globalreporting.org/standards

D. Assurances

27. Consistent with the Agreement Establishing the Asian Development Bank (the Charter)[17] ADB will proceed with the proposed assistance upon establishing that the Government of Viet Nam has no objection to the proposed assistance to China Everbright International Limited. 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

28. 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 the direct loan of up to $100,000,000 from ADB's ordinary capital resources to China Everbright International Limited for the Municipal Waste-to-Energy Project in Viet Nam, 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

8 November 2017

[17] ADB. 1966. *Agreement Establishing the Asian Development Bank.* Manila.

DESIGN AND MONITORING FRAMEWORK

Impacts the Project is Aligned with

Use of solid waste for power generation as part of the country's solid waste management strategy increased[a]

Share of biomass-based power plants increased, which include waste-to-energy facilities, to account for about 2.1% of the country's total installed capacity by 2030[b]

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome MSW treated and energy from environmentally sustainable WTE plants in Viet Nam produced	By 2028: a. 2.5 million tons of MSW treated by municipal WTE plants per year, on average (2017 baseline: 0 ton) b. 790 GWh of electricity generated and delivered to EVN from WTE plants per year, on average (2017 baseline: 0 GWh) c. 325 jobs provided during operation phase (2017 baseline: 0) d. Number of jobs provided to women during operation amount to at least 78[c] (2017 baseline: 0) e. About 787,300 tCO2e emissions avoided per year	a–e. CEIL annual project monitoring and development effectiveness monitoring reports	Lower-than-estimated MSW during project operation
Outputs 1. WTE plants constructed across Viet Nam	1a. 110 MW installed power capacity from municipal WTE plants commissioned by 2022 (2017 baseline: 0 MW) 1b. 7,500 tons per day of MSW treatment capacity from municipal WTE plants commissioned by 2022	1–3. CEIL annual project monitoring and development effectiveness monitoring reports	Host local governments delay the granting of concession rights, support in securing land-use rights or right-of-way to the private sector because of unforeseen regulation changes

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	(2017 baseline: 0 tons per day)		
2. Growth of local economy supported	2. $250 million of local purchase of goods and services during construction by 2022 (2017 baseline: 0)		
3. Local employment generated	3a. 1,500 jobs provided during construction phase by 2022 (2017 baseline: 0)		
	3b. Number of jobs provided to women during construction amount to at least 75 (2017 baseline: 0)		
Key Activities with Milestones **Outputs 1–3. WTE plants across Viet Nam constructed; growth of local economy supported; local employment generated** 1. Signing of the loan agreement by Q1 2018. 2. Corporate environmental and social management system operational by Q1 2018. 3. Construction work in progress, as scheduled.			
Assumptions for Partner Financing Not applicable			

GWh = gigawatt-hour, MSW = municipal solid waste, MW = megawatt, Q = quarter, tCO2e = ton of carbon dioxide equivalent, WTE = waste-to-energy.

[a] Ministry of Construction and Ministry of Natural Resources and Environment of Viet Nam. 2009. *The National Strategy for Integrated Management of Solid Waste up to 2025 with a Vision to 2050*. Ha Noi.

[b] Government of Viet Nam. 2016. *National Power Development Plan VII for the period of 2016 – 2020 with the vision to 2030*. Ha Noi.

[c] Assumes that CEIL maintains its current ratio of female employees at 24%.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=50371-001-4

1. Sector Overview
2. Client Information
3. Details of Implementation Arrangements
4. Contribution to the ADB Results Framework
5. Financial Analysis
6. Economic Analysis
7. Country Economic Indicators
8. Summary Poverty Reduction and Social Strategy
9. Safeguards and Social Dimensions Summary
10. Findings of the Corporate Safeguards Audit: Environmental and Social Management System Arrangement

Supplementary Documents

11. Integrity and Tax Due Diligence Disclosure
12. Financial Projections