



# Report and Recommendation of the President to the Board of Directors

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Project Number: 46930  
November 2012

## Proposed Loan and Technical Assistance Dynagreen Environmental Protection Group Company Dynagreen Waste-to-Energy Project (People's Republic of China)

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## CURRENCY EQUIVALENTS

(as of 1 November 2012)

Currency units	–	yuan (CNY)
CNY1.00	=	\$0.15869
\$1.00	=	CNY6.3017

## ABBREVIATIONS

ADB	–	Asian Development Bank
BSAM	–	Beijing State-Owned Assets Management Company
CPS	–	country partnership strategy
MSW	–	municipal solid waste
PRC	–	People's Republic of China
TA	–	technical assistance
WTE	–	waste-to-energy

## NOTES

- (i) The fiscal year (FY) of Beijing State-Owned Assets Management and Dynagreen Environmental Protection Group ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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## PROJECT AT A GLANCE

<b>1. Project Name:</b> Dynagreen Waste-to-Energy Project		<b>2. Project Number:</b> 46930	
<b>3. Country:</b> People's Republic of China		<b>4. Department/Division:</b> Private Sector Operations Department Infrastructure Finance Division 2	
<b>5. Sector Classification:</b>			
	Sectors	Primary	Subsectors
	Water supply and other municipal infrastructure and services	✓	Waste management Renewable energy
<b>6. Thematic Classification:</b>			
	Themes	Primary	Subthemes
	Economic growth		Widening access to markets and economic opportunities
	Environmental sustainability	✓	Global and regional trans-boundary environmental concerns
<b>6a. Climate Change Impact:</b>		<b>6b. Gender Mainstreaming:</b>	
Adaptation		Gender equity theme	
Mitigation	✓	Effective gender mainstreaming	
Not applicable		Some gender benefits	
		No gender benefits	✓
<b>7. Targeting Classification:</b>		<b>8. Location Impact:</b>	
	<b>Targeted Intervention</b>		
	Geographic dimensions of inclusive growth	Millennium development goals	Income poverty at household level
✓			
	Rural		
	Urban	High	
	National		
	Regional		
<b>9. Nonsovereign Operation Risk Rating : NSO 7</b>			
<b>10. Safeguard Categorization:</b>			
	Environment		<b>B</b>
	Involuntary resettlement		<b>B</b>
	Indigenous peoples		<b>C</b>
<b>11. ADB Financing:</b>			
	<b>Sovereign/Nonsovereign</b>	<b>Modality</b>	<b>Source</b>
	Nonsovereign	A loan	OCR
	Nonsovereign	Local currency complementary loan	Commercial lenders
	Nonsovereign	Grant	TASF
			<b>Amount (\$ million)</b>
			<b>Up to \$100 million equivalent in local currency</b>
			<b>Up to \$100 million equivalent in local currency</b>
			<b>Up to \$500,000</b>
<b>12. Cofinancing:</b>			
	<b>Financier</b>	<b>Category</b>	<b>Amount (\$ million)</b>
	Local commercial banks	Commercial loan	Up to \$178 million equivalent in local currency
	<b>Total</b>		
<b>13. Counterpart Financing:</b> Not Applicable			
<b>14. Aid Effectiveness:</b> Not Applicable			

## I. THE PROPOSAL

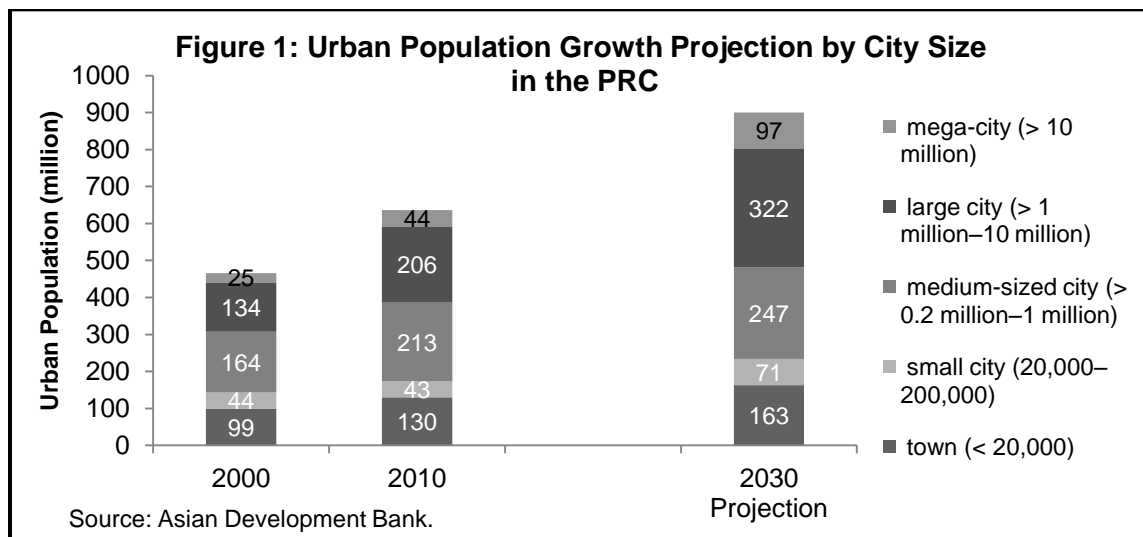
1. I submit for your approval the following report and recommendation on a proposed loan of up to \$200 million equivalent without government guarantee to Dynagreen Environmental Protection Group Company, comprising (i) an A-loan of up to \$100 million equivalent in yuan, and (ii) a local currency complementary loan of up to \$100 million equivalent in yuan for the Dynagreen Waste-to-Energy Project in the People's Republic of China (PRC). This report also describes proposed technical assistance (TA), and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, will approve the TA.

## II. THE PROJECT

### A. Project Identification and Description

#### 1. Project Identification

2. The PRC is currently the world's second-largest generator of solid wastes, producing more than 220 million tons annually. The country's urban population has more than tripled, from 190 million in 1980 to 691 million in 2011, accounting for 51.3% of the national population; it is expected to account for more than 60% of the total by 2030, an incremental increase of about 200 million people. This demographic shift has led to significant increases in municipal solid-waste (MSW) generation. Although the per capita production of solid waste in the PRC is only about 21% of the average in industrialized nations, it is expected to grow considerably in small and medium-sized cities in particular where population growth of 24% by 2030 is expected.



3. In the past, the provision of MSW treatment was considered a basic social right and was provided by the government free of charge. This system has led to a serious environmental problem in municipalities, where large quantities of waste are dumped in unengineered landfills. Furthermore, an imbalance in the quality of project development has been observed between large and small cities, with only a limited number of small cities having appropriate waste disposal facilities.<sup>1</sup>

<sup>1</sup> ADB. 2012. *Technical Assistance Completion Report: Urban Wastewater and Solid Waste Management for Small Cities and Towns*. Manila.

4. Waste-to-energy (WTE) is recognized as the single most effective method for MSW treatment, as it reduces waste volume by 90% and eliminates methane emissions. WTE technologies recover the waste heat from the incineration process and produce electricity and heat. By substituting for fossil fuel combustion and avoiding methane, it reduces greenhouse gas emissions and mitigates climate change. Under its 12th Five Year Plan, 2011–2015, the Government of the PRC targets to (i) treat 100% of MSW in municipalities larger than province capital cities, and the cities specifically designated in the state plan, and treat over 90% in other smaller cities; and (ii) among waste treatment options, treat 35% through WTE technologies. It is estimated that investment of CNY173 billion (\$27.3 billion) in MSW treatment facilities will be required. The government has further issued a series of policies and regulations to support municipal WTE, such as (i) full offtake of electricity generated by WTE plants; (ii) national targets by 2015, including 20% of the total energy to be generated from renewable energy sources and municipal WTE capacity to reach 3 gigawatts; (iii) value-added tax refund; and (iv) electricity feed-in tariff of CNY0.65 per kilowatt-hour for municipal WTE plants, compared with the nationwide average base rate tariff of CNY0.40 per kilowatt-hour from coal-based power generation.

5. To achieve these national targets and to promote cleaner WTE technologies with sustainable financing and the timely delivery of public services, increasing numbers of municipal governments, including those of smaller cities, have been opening the sector for specialized WTE companies through concession. However, a lack of access to finance has been a bottleneck to promoting cleaner waste management projects in smaller cities.

6. In response to the PRC's increasing challenges of ensuring livable cities and sustainable development, sovereign and private sector operations of the Asian Development Bank (ADB) have been focusing on municipal environmental infrastructure. ADB's East Asia Regional Department has been supporting broad-based policy and regulatory reforms since 2000<sup>2</sup> and has identified state-owned enterprises that take over the traditional responsibility of municipal governments in providing environmental infrastructure. Among the state-owned enterprises, Dynagreen—the environmental infrastructure arm of Beijing State-Owned Assets Management Company (BSAM)—was found to possess a desirable business model that can leverage its operational experience with clean technologies to pursue new ventures in small and medium-sized cities, which are often too small to attract private sector participation. Dynagreen distinguishes itself from its peers<sup>3</sup> through its clear focus on small and medium-sized subprojects of 500–1,000 tons daily processing capacity. This is about half the average size of engagement of its peers. Unlike most plants in this size range, the technologies that Dynagreen employs do not require coal as supplemental fuel to burn low-calorific-value waste.

## 2. Project Design

7. The project will address the need to treat MSW in small and medium-sized cities and supply electricity to the local grid. The ADB loan will be channeled through Dynagreen to fund a series of WTE subprojects with total capacity of up to 6,300 tons of MSW per day and to generate approximately 610 gigawatt-hours of electricity annually by 2018. Each subproject incinerates waste, recovers waste heat for power generation, purifies waste gas, and disposes of ash. The criteria used in selecting municipalities include (i) populations of more than 0.5 million generating in excess of 600 tons of MSW per day; (ii) exclusive rights to operate WTE

<sup>2</sup> ADB. 2000. *Technical Assistance to the People's Republic of China for Strengthening Urban Solid Waste Management*. Manila.

<sup>3</sup> Private sector enterprises such as China Everbright International; and nonsovereign public enterprises such as Chongqing Sanfeng, Shanghai Environment, and Shenzhen Energy.

plants in well-defined areas through concession agreements, which guarantees a minimum MSW supply; (iii) a clear and transparent municipal waste management policy; and (iv) sufficient financial capacity to uphold its end in the partnership.

8. The project is designed to be a least-cost solution to financing small and medium-sized WTE subprojects; such financing involves relatively high transaction costs. ADB aims to finance the subprojects on a portfolio basis to reduce financing transaction costs and diversify risk. This portfolio approach is broad in reach and will enable ADB to provide financing support for multiple WTE subprojects that are often too small and time-consuming for ADB or international banks to finance on a stand-alone basis.

9. To achieve long-term environmentally sustainable growth and to set standards in the fast-growing waste management industry, the proposed ADB assistance will incorporate loan conditions such as maintenance of a transparent corporate governance structure and adoption and maintenance of an environmental and social management system consistent with ADB's Safeguard Policy Statement (2009). These components of the project are expected to serve as best-practice examples to Dynagreen's peers in the industry, enhancing its demonstration effects.

### **3. The Guarantor and the Borrower**

10. BSAM will guarantee the payment obligations of the borrower under ADB's loan. Funded and entrusted by the Beijing municipal government, BSAM is an exclusively state-invested limited liability company whose subsidiaries are engaged in managing, supervising, and operating state-owned assets. BSAM focuses its business investments in four major fields: (i) urban development, environmental protection, and new energies; (ii) financial services; (iii) hi-tech manufacturing; and (iv) culture and sports infrastructure.

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11. The borrower of the project is Dynagreen, which is the sole environmental infrastructure holding company in the BSAM group. The scope of business of Dynagreen and its project companies covers not only construction, operation, and management of WTE power plants, but also technology research and development in relation to WTE power plants and consulting services on overall solutions to municipal waste treatment. Since its incorporation in 2000, Dynagreen has successfully implemented municipal WTE plants and developed the proprietary three-driving and reverse-feeding reciprocating grate incineration technology<sup>4</sup> based on the design of Martin GmbH, one of the world's leading WTE technology providers.

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## **B. Development Impact, Outcome, and Outputs**

### **1. Impact**

12. **Improved urban solid-waste management in small and medium-sized cities.** The project will contribute to improved municipal waste management in the PRC. The special focus of the project is on small and medium-sized cities which currently have significant issues with untreated MSW, which in turn emit harmful gases and contaminate soil and groundwater. The

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<sup>4</sup> The patent was awarded by the PRC National Intellectual Property Bureau.

impact of deploying effective waste management technologies such as incineration under the project is to catalyze MSW management investments that treat larger volumes of municipal waste in a safe and environmentally friendly manner.

13. **Increased renewable energy generation capacity from municipal waste.** The project features an innovative model for state-owned enterprises to take part in municipal WTE infrastructure development on a concession basis for multiple subprojects. The demonstration impact of the project is expected to be an increase in similar MSW management and WTE investments that help meet the government's target of increasing WTE-based energy generation capacity to 3 gigawatts by 2020.

## 2. Outcome

14. The outcome will be increased production of energy from technically efficient and environmentally sustainable WTE power plants in small and medium-sized cities in the PRC. The WTE plants to be supported under the project will treat 2.8 million tons of MSW annually, generate 610 gigawatt-hours of clean energy annually, and reduce carbon dioxide emissions by about 450,000 tons per year. Energy generation from municipal WTE plants will reduce greenhouse gas emissions by replacing electricity otherwise generated by coal-fired plants, and avoiding methane otherwise generated from unsanitary landfills.

## 3. Outputs

15. The output will be the construction of at least nine WTE plants with an aggregate capacity of 120 megawatts. All the plants will be built in accordance with ADB's Safeguard Policy Statement (2009), and will also meet the national emissions standard of the PRC.

## C. Alignment with ADB Strategy and Operations

### 1. Consistency with Strategy 2020

16. The project is consistent with ADB's Strategy 2020, which identified infrastructure and environment as two of the five core areas in which ADB will employ its financial and institutional resources to maximize results, efficiency, and impact.<sup>5</sup> On infrastructure, the project will embody the strategy, which sets forth that ADB will help expand the supply of energy, and support clean energy. With respect to the environment, the project is in line with the strategy's focus on climate change and complementary actions.

### 2. Consistency with Country Strategy

17. ADB's country partnership strategy (CPS) for the PRC is based on three development pillars: inclusive growth, environmentally sustainable growth, and regional cooperation and integration.<sup>6</sup> The CPS also sets out four priority sectors: natural resources and agriculture, energy, transport, and urban development. The CPS specifically states that ADB's nonsovereign operations will continue to finance catalytic projects, focusing on innovative financing solutions and demonstration projects for infrastructure investment, particularly in clean energy, urban environmental protection, and social infrastructure. The project will address energy and urban development sectors to leverage ADB's comparative strengths and expertise

<sup>5</sup> ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

<sup>6</sup> ADB. 2012. *Country Partnership Strategy: People's Republic of China, 2011–2015*. Manila.



through provision of finance to a nonsovereign client in a new sector where commercial finance is still scarce. It will thus contribute to the CPS objective of supporting environmentally sustainable growth in the PRC. The project is fully consistent with the CPS and will complement ADB's overall support for urban development in the PRC through investment projects and knowledge products. In particular, the project benefits from public sector operations' policy advice and lessons learned from public sector waste management projects.

### 3. Consistency with Sector Strategy

18. The project is consistent with ADB's Energy Policy.<sup>7</sup> Under the policy, ADB's investments will focus on energy efficiency and renewable energy projects, as well as expansion of energy access. The policy states that support for renewable energy projects will be prioritized and broadened with the objective of creating a framework that makes investing in renewable energy commercially viable.

19. The project is in line with ADB's efforts to strengthen nonsovereign operations<sup>8</sup> and has a significant demonstration impact as the first ADB intervention with a public enterprise to take over the municipal government responsibility of providing waste management infrastructure.

#### D. Project Cost and Financing Plan

20. Dynagreen's investment plan indicates a total investment of \$454 million equivalent to treat approximately 6,300 tons of waste daily with installed capacity of 120 megawatts to generate about 610 gigawatt-hours of electricity annually by 2018. The plan includes civil works, erection, equipment and materials, other local procurement, and working capital for WTE subprojects between 2013 and 2017.

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#### E. Implementation Arrangements

21. Table 2 summarizes the implementation arrangements.<sup>9</sup>

**Table 2: Summary of Implementation Arrangements**

Aspects	Arrangements
Regulatory framework	Each project company will be awarded a concession of 25–30 years, and the concession agreement sets out the municipal solid-waste treatment fee and the minimum amount of waste to be supplied by the municipal government.
Management	All WTE subprojects will be supervised and managed by Dynagreen.
Implementation period	January 2013–January 2017
Construction arrangements	
Type of arrangement	Goods and services will be procured adopting ADB's private sector procurement procedures from ADB member countries in a transparent manner, through competitive bidding procedures and in accordance with Dynagreen's procurement guidelines. Each project company will enter into engineering, procurement, and construction contracts with subcontractors.
Operation arrangements	
Revenue structure	A power purchase agreement will be executed between a project company and a

<sup>7</sup> ADB. 2009. *Energy Policy*. Manila.

<sup>8</sup> ADB. 2011. *Mainstreaming Nonsovereign Public Sector Financing*. Manila.

<sup>9</sup> Details of Implementation Arrangements (accessible from the list of linked documents in Appendix 2).

Aspects	Arrangements
	local grid, owned by the State Grid Corporation of China, for the total annual generation. In addition, each WTE plant will be paid a waste treatment fee by municipal government based on the amount of waste delivered to the plant. The fee is generally determined through a competitive bidding process and will be adjusted reflecting the cost and inflation.
Major cost structure	There are no fuel costs for municipal WTE subprojects. The major costs consist of waste treatment cost, maintenance expense, and administrative expense.
Operation and maintenance	Operation and maintenance will generally be handled by each project company's staff, who will be transferred from Dynagreen and/or recruited from outside.
Performance monitoring	Key performance indicators, including output and outcome indicators, and compliance with ADB's safeguard requirements, will be reported by Dynagreen.

ADB = Asian Development Bank, WTE = waste-to-energy.

Source: Asian Development Bank.

## F. Projected Financial and Economic Performance

22. The project is financially viable as Dynagreen's expected financial internal rate of return is higher than the weighted average cost of capital and economically viable as the economic internal rate of return is higher than the social discount rate of 12%.

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## III. THE PROPOSED ADB ASSISTANCE

### A. Loan

23. ADB will provide a loan of up to \$200 million equivalent in yuan to Dynagreen, comprising an A-loan (of up to \$100 million equivalent) and a local currency complementary loan (of up to \$100 million equivalent). ADB will fund the A-loan from its ordinary capital resources and the local currency complementary loan will be funded by commercial banks. ADB's loan will be supported by an unconditional, irrevocable payment guarantee from BSAM. The proposed A-loan will have a maturity of up to 10 years, including a 4-year grace period on principal repayments. The local currency complementary loan will have a maturity equal to or shorter than that of the A-loan.

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### B. Technical Assistance

#### 1. Impact, Key Activities, and Output

24. For the project to succeed and for Dynagreen to cope with its rapid growth, well-defined, transparent, effective, and efficient corporate governance is an indispensable prerequisite. Good governance will also attract commercial lenders and support Dynagreen's plan of further commercialization. The TA will have two components: (i) assessment and evaluation of Dynagreen's current corporate governance framework and internal risk management, and (ii) capacity building to enhance and consummate Dynagreen's corporate governance system. The TA is classified as capacity development technical assistance category B and is estimated to cost \$500,000.

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## 2. Implementation Arrangements

25. ADB will be responsible for all implementation issues but will have the full support of and cooperation from Dynagreen. ADB and Dynagreen will form a TA task force comprising representatives at appropriate levels from ADB and Dynagreen, as well as the consultants to be hired. The task force will communicate regularly to assess needs, monitor progress, and discuss issues. A consulting firm will be selected using the quality- and cost-based selection method with simplified technical proposals. Recruitment of the firm will be in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). Disbursements under the TA will be made in accordance with ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

### C. Value-Added by ADB Assistance

26. Justification for ADB's involvement in the proposed project is based on the following:
- (i) ADB will be catalytic in promoting the commercialization of MSW treatment through a project that combines several innovative features in PRC infrastructure finance. It is structured as a multiproject loan facility, in effect bundling small and medium-sized subprojects to avoid the high transaction costs associated with stand-alone project financing and to diversify risk. In addition, the local currency complementary loan will mobilize cofinancing where little domestic bank participation has been evident to date, given the high transaction costs and upfront capital costs. ADB's loan is structured to provide a tenor sufficient to allow Dynagreen to amortize these upfront capital costs over the long life of the assets and ensure its investments are commercially viable.
  - (ii) By promoting the know-how transfer to smaller municipalities under commercial concessions, ADB will be supporting environmentally sustainable improvements in waste treatment and contributing to the PRC's renewable energy generation activities. The project builds on ADB's complementary interventions with private companies in the areas of WTE projects in second-tier cities.<sup>10</sup> ADB's experience with the project can meaningfully contribute to the dialogue on regulations in the PRC and the region, and reflects a continuation of ADB's effort to help establish effective and efficient solutions for waste management.
  - (iii) ADB's requirements will ensure that Dynagreen adheres to high standards of corporate governance and environmental and social protection, serving as a model for the industry in small and medium-sized cities. ADB will support Dynagreen's efforts to improve its corporate governance in alignment with the principles set by the Organisation for Economic Co-operation and Development, and the TA will advise on development of enhanced corporate governance, privatization, and minority shareholding rights.

### D. Risks

27. **Guarantor credit risk.** ADB's loan will be unconditionally and irrevocably guaranteed by BSAM. Detailed analysis shows the credit strengths of BSAM including (a) strong market

<sup>10</sup> 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 PRC*. Manila.

position of most of its operating subsidiaries given its close relationship with the Beijing municipal government, (b) stable revenue growth, (c) good financial flexibility, and (d) moderate leverage position and strong equity base. These are constrained by BSAM's moderate earnings, cash flow coverage, and substantial exposure to high-tech industrial park development. BSAM's overall credit standing is assessed satisfactory and provides an adequate credit enhancement.

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28. **Aggressive expansion plan.** Dynagreen's plan to develop up to nine plants with a total daily capacity of up to 6,300 tons in four years' time requires significant management resources; and substantial capital funding. This aggressive expansion plan involves execution and funding risks which are partially mitigated by: (a) Dynagreen's technical competence, including use of standardized management systems across its subprojects, use of industry experts, shared technical resources at several operational hubs, and the homogeneous nature of the subprojects, and (b) adoption of eligibility criteria in the selection of subprojects and monitoring of compliance with financial covenants to ensure project viability.

29. **Completion risk.** The project involves high capital expenditure for the construction of WTE plants, making cost overrun and delay a potential risk. This is mitigated by Dynagreen's technical expertise and control measures, including progress payments with subcontractors.

30. **Operation and maintenance risk.** Due diligence has confirmed Dynagreen's reliable track record in existing WTE plants and its ability to increase efficiency and meet quality and safety standards. Dynagreen also implemented standardized control systems to minimize operation risks and it has management expertise, strong technical training system, and rotation of senior engineers.

31. **Waste supply and treatment fee risk.** Revenue risk may arise from low waste supply and treatment fees. Mitigating this risk are (a) large latent demand for waste treatment and Dynagreen's practice of selecting subprojects in part based on demand potential; (b) government policies which mandate that tariffs provide cost-recovery and adequate returns to utility operators; (c) concession agreements with guaranteed minimum waste supply; (d) Dynagreen's assessment of waste treatment fees to ensure financial viability in selecting subprojects; (e) the portfolio nature of ADB's assistance, which diversifies risk across subprojects; and (f) Dynagreen's track record, which will assist in securing the support of municipal governments in aggregating waste from surrounding smaller counties.

32. **Regulatory risk.** It is unclear whether the current fixed feed-in tariff will remain unchanged during the life of ADB's loan as it appears that the regulator can change the tariff at its discretion. In the worst case, should the feed-in tariff be abolished, the regulations still support premium over the average coal-fired tariff applicable for 15 years from operation.

33. **Structural subordination.** ADB's loan will be structurally subordinated to direct loans raised by the project companies from local banks. This risk is partially mitigated by various measures employed by other ADB projects with similar project structure.

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## IV. POLICY COMPLIANCE

### A. Safeguards and Social Dimensions

34. The project is classified category B for environment, category B for involuntary resettlement, and category C for indigenous peoples. Since 2002, WTE plants in the PRC have been required to have a full environmental assessment. The sites for Dynagreen's municipal WTE plants are selected in coordination with the respective municipal governments to minimize impacts on the environment and nearby communities. Emission levels of major air pollutants are found to comply with PRC national standards. Dynagreen's WTE plants meet the European Union 2000 standard for dioxins, which is 10 times more stringent than the PRC national standard. Fly ash is collected and cemented prior to disposal in a landfill. Bottom ash is reused in various ways by the construction industry. Wastewater is treated onsite and is both reused and recycled. Land acquisition, compensation, resettlement, and rehabilitation are expected not to be significant and, if needed, are normally carried out by the municipal governments. Since all subprojects will be implemented in small and medium-sized cities, the project will not have any impacts on ethnic minorities.

35. Dynagreen's environmental and social management system incorporates measures to avoid, minimize, and mitigate the potential adverse environmental and social impacts of its subprojects. The audit of Dynagreen's implementation of its environmental and social management system is found to be satisfactory. Dynagreen's experience with its existing WTE plants ensures that the environmental and social impacts of future municipal WTE plants will have adequate mitigating measures and monitoring and reporting programs. The institutional capacity and commitment of Dynagreen to manage the project's social and environmental impacts are deemed adequate and the company has committed to enhancing its environmental and social management system to meet ADB Safeguard Policy Statement requirements. To ensure compliance with ADB's Safeguard Policy Statement, Dynagreen will be required to prepare an initial environmental examination and a resettlement or land acquisition planning report for each subproject and submit these to ADB for review and approval, and implement the approved plans. Dynagreen will also be required to submit annual monitoring reports. ADB will ensure that the investment documentation includes appropriate provisions requiring Dynagreen to comply with national labor laws and to take specific measures (including in relation to contractors), in compliance with ADB's Social Protection Strategy.<sup>11</sup> Dynagreen will be required to report to ADB on compliance with such measures. A *no gender element* classification is assigned for the proposed project.

### B. Anticorruption Policy

36. Dynagreen 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

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

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<sup>11</sup> ADB. 2003. *Social Protection*. Manila (adopted in 2001).

**D. Assurances**

38. Consistent with the Agreement Establishing the Asian Development Bank,<sup>12</sup> the government's no objection to the proposed assistance will be obtained. 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**

39. 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 loan of up to \$200,000,000 equivalent without government guarantee for the Dynagreen Waste-to-Energy Project in the People's Republic of China, comprising

- (i) an A-loan to Dynagreen Environmental Protection Group of up to \$100,000,000 in yuan equivalent from ADB's ordinary capital resources; and
- (ii) a local currency complementary loan of up to \$100,000,000 equivalent in yuan to be funded by commercial banks;

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.

Haruhiko Kuroda  
President

19 November 2012

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<sup>12</sup> ADB. 1966. *Agreement Establishing the Asian Development Bank*. Manila.

## DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p><b>Impacts</b></p> <p>Improved urban solid-waste management in small and medium-sized cities of the PRC</p> <p>Increased renewable energy generation capacity from municipal waste in the PRC</p>	<p>70% of MSW in the PRC is treated, with 30% incinerated in cities, by 2020 (from 63.5% of MSW treated with 14.7% incinerated in cities in 2010)<sup>a</sup></p> <p>Total installed capacity of municipal WTE plants in the PRC reaches 3 gigawatts by 2020 from approximately 1.7 gigawatts in 2010<sup>b</sup></p>	<p>Central and municipal government reports and statistics</p> <p>Published environmental market and industry reports</p> <p>National Development and Reform Commission and China Electricity Council reports</p>	<p><b>Assumption</b></p> <p>The government remains committed to safe waste treatment and environmental protection.</p> <p><b>Risk</b></p> <p>MSW generation grows faster than MSW treatment capacity.</p>
<p><b>Outcome</b></p> <p>Technically efficient and environmentally sustainable solid-waste management and WTE solutions developed in small and medium-sized cities in the PRC</p>	<p>2.8 million tons of MSW is treated per annum on average by 2018<sup>c</sup></p> <p>About 610 gigawatt-hours of clean energy is produced annually by WTE plants by 2018</p> <p>CO<sub>2</sub> emissions are reduced by approximately 450,000 tons per annum by 2018</p> <p>Average financial internal rates of return of WTE subprojects exceed the weighted average cost of capital of 5.9%</p> <p>Up to 700 local workers employed by nine WTE plants during operation</p> <p>CNY45 million of local goods and services procured during operations on average per annum starting 2018–2019</p> <p>CNY24 million in additional corporate income tax paid on average to government</p>	<p>Company reports on operations</p> <p>Project monitoring reports; development effectiveness monitoring reports</p> <p>Company reports on operations and project monitoring reports</p> <p>Project monitoring reports; development effectiveness monitoring reports</p> <p>Project monitoring reports</p> <p>Project monitoring reports</p> <p>Audited financial statements</p>	<p><b>Assumption</b></p> <p>Municipal governments and off-takers honor the concession and MSW supply agreements.</p> <p><b>Risk</b></p> <p>Unforeseeable technical issues keep the plants from being fully utilized.</p>

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	per annum starting 2018–2019  Core recommendations of the TA satisfactorily implemented	Project monitoring reports	
<b>Outputs</b>  Installation and operation of nine WTE plants	Nine WTE plants with a total capacity of 120 megawatts are constructed and installed by 2017  CNY2.5 billion of local goods and services procured during construction by 2017  Up to 45,000 person-months of local employment provided during construction  Completion of TA study on corporate governance	Project monitoring reports  The borrower's financial reports  Project monitoring reports  TA study	<b>Assumption</b>  Project sponsor maintains technical and operating capacity to complete WTE subprojects and implement services.  <b>Risk</b>  Competition becomes so intense that Dynagreen cannot secure new subprojects as planned.
<b>Activities with Milestones</b> 1.1 Signing of loan agreement by Q1 2013 1.2 Financial closure by Q1 2013 1.3 Clearance of all loan drawdown conditions by Q1 2013  2.1 Award of concession(s) for WTE subprojects by 2017 2.2 Construction work as scheduled in accordance with engineering, procurement, and construction subcontracts by 2017 2.3 Commissioning of WTE plants by 2017			<b>Inputs</b> ADB: Up to \$100 million equivalent A-loan in yuan; Up to \$100 million equivalent complementary loan in yuan; \$500,000 TA funded by TASF-other sources.  Dynagreen: Equity to meet debt-equity ratio  Commercial banks: Local currency loans to WTE project companies

ADB = Asian Development Bank, CO<sub>2</sub> = carbon dioxide, MSW = municipal solid waste, PRC = People's Republic of China, TA = technical assistance, TASF = Technical Assistance Special Fund, WTE = waste-to-energy.

<sup>a</sup> National Bureau of Statistics of China. 2011. *China Statistical Yearbook*. Beijing.

<sup>b</sup> National Energy Administration. 2012. *National 12<sup>th</sup> Five-year Plan for Biomass Energy Development*. Beijing.

<sup>c</sup> This is the cumulative amount of gross waste treated by the nine WTE plants. Actual amount of waste incinerated for energy generation by each plant depends on the type of waste generated by each city.

Source: Asian Development Bank.