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WASTE IN ASIA

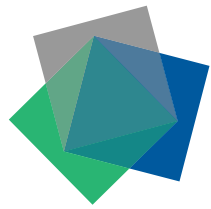
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RESPONSIBLE RESEARCH

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Responsible Research is an independent provider of sectoral and thematic Asian environment, social and governance (ESG) research, targeted at global institutional investors. Many of these fund managers and asset owners now find that traditional investment banking reports, financial models and public information sources can no longer be relied on to cover all risks to earnings and deliver superior returns. Companies who do not monitor and report on this 'non-financial' performance not only risk financial penalties for non-compliance with stricter regulatory environments but are also denied access to substantial pools of global capital which are managed according to sustainable principles.

Our approach is based on analysis of material ESG factors, which change according to sector and market. We provide our clients with local market knowledge of important regulatory landscapes in Asia, along with a fresh perspective on local operational and sectoral issues. We offer an annual subscription model for our monthly sectoral or thematic reports and give our clients access to the underlying data. Reports can also be commissioned (by investors or foundations) and kept for internal use or be offered for general distribution, as part of a general effort to promote ESG integration into the Asian investment process. Our analysts conduct seminars and webinars to discuss findings, often with contributions from experts, companies and policy-makers.

Responsible Research was founded in 2008 by our Board members who have been instrumental in promoting Corporate Social Responsibility (CSR) and SRI practices in Asia for over 10 years and have significant experience in the regions emerging investment markets. This team of five works in collaboration with our full time Asian-based responsible investment analysts and the Responsible Research Alliance, a group of consultants with subject matter expertise. Together they provide a valuable balance of market and ESG knowledge, academic rigour, process management, data management, customer relationship management and senior level contacts.

Many of our clients are signatories to the UN backed Principles of Responsible Investment (PRI), an investor initiative. As signatories they commit to incorporate ESG issues into their investment analysis and to support the development of ESG tools, metrics and methodologies. As a signatory to the PRI we voluntarily contribute time and resources to the Emerging Markets Disclosure Project and other collaborative initiatives. Responsible Research is also a strong supporter of independence in research, without which conflict and bias can deliver investment risk. The company is one of the founding members of the Asian Association of Independent Research Providers and also of the Asian Water Project.



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REPRISK

Responsible Research is the exclusive partner in Asia for RepRisk®, a web-based tool which provides insights on environmental and social issues that present financial and reputational risks to companies and investment portfolios. The tool enables commercial and investment bankers, asset managers, and supply chain managers to manage the corresponding risks and to implement effective screening procedures.

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RepRisk® is a web-based tool that allows you to identify and assess the environmental and social issues which may present financial, reputational and ethical risks. It is used by investment professionals, financial institutions, supply chain managers, multinational corporations and compliance managers, and includes a variety of features enabling clients to monitor risk trends over time, create customized watch lists, tailor alert services and more. The tool plays an integral role in increasing transparency and ensuring compliance with internal and international standards, thereby helping reduce risk exposure.



The comprehensive and relevant RepRisk® database enables you to meet the risk management and compliance challenges in an increasingly complex world. On a daily basis, RepRisk tracks a company's or project's environmental and social risk exposure by monitoring independent third-party sources such as all major print media, over 700 NGOs, newsletters, news sites, governmental agencies and blogs. Controversial issues covered include environmental footprint and climate change, human rights and community relations, labour conditions and employee relations as well as corruption and money-laundering. In particular, all principles of the UN Global Compact are addressed. RepRisk covers all major business languages (Chinese, English, French, German, Japanese, Korean, Portuguese, Russian, and Spanish) and its database currently includes over 15,400 companies and 3200 projects, and is updated and growing daily.

Please contact info@responsibleresearch.com for more information.

EXECUTIVE SUMMARY

This report examines the environmental, social and governance (ESG) issues in the waste sector in Asia. Through a discussion of the current situation and trends in the Asian waste landscape supported by case studies of waste management companies in the region, the report highlights the ESG risks and opportunities that companies face on a strategic and operational level. As a key pillar of the environmental goods and services sector, responsible waste management drives sustainability, a prerequisite for continued economic progress in Asia.

Companies that incorporate ESG considerations in their business strategy and operations are better positioned to minimise secondary pollution from waste, generate social goodwill and gain stakeholder support for their services. Institutional investors can act in their fiduciary capacity on behalf of individual investors to exercise informed ownership through the monitoring and engagement of companies to improve their management of these critical issues.

The report begins with an introduction of the landscape for waste in Asia and a brief overview of waste principles and policies. This is followed by a discussion of the ESG risks and opportunities in three main sections of environment, social aspects and governance. The report concludes with a company benchmarking of ten selected Asian waste companies using the Asian Sustainability Rating™ system (ASR™). The ASR™ is a tool developed by Responsible Research that is used by investors to benchmark portfolios and add a sustainability dimension to investment decision-making and engagement practices. Four global waste companies are benchmarked as well to provide a comparative guide to the performance of the Asian companies.

Environment

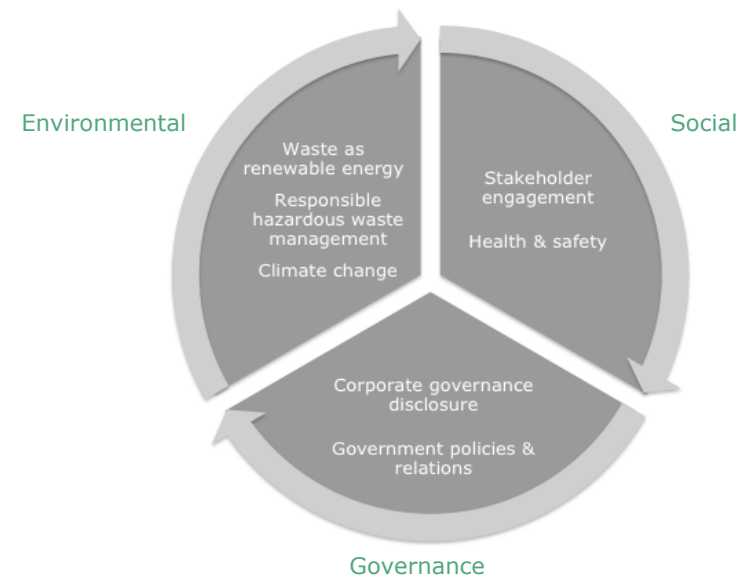
The paradigm shift in Asia's waste sector is the increasing focus on waste as a source of renewable energy rather than a problem to be hidden. Waste management has evolved from simple collect-and-dispose models to technology-driven treatment systems that convert waste into thermal power. While landfill remains the dominant method of waste disposal, energy recovery systems that convert waste to energy and reduce the final amount of waste for landfill disposal are gaining in popularity throughout the region.

Asian waste companies are active in developing energy recovery systems such as landfill gas capture, incineration plants and biogas extraction units. Waste as a renewable energy creates new opportunities through climate change projects, where companies can seek financial assistance via the sale of carbon credits for waste projects that reduce greenhouse gas (GHG) emissions. Many

companies have embarked on such projects, particularly in landfill gas capture, although success has been varied due to technical challenges associated with waste and suitability. However, firms that tap into waste-related energy opportunities need to ensure strict and transparent monitoring of emissions so that no air, water and land pollution results from the treatment process.

Hazardous waste management in Asia requires urgent action to keep up with expanding industrial activity. Deficient environmental regulations and poor enforcement in developing Asia result in the illegal dumping of waste by industrial generators, devastating the environment and reducing business opportunities for hazardous waste treatment companies. Global trade in hazardous waste also cripples environmental and human health in countries that receive a major share of the illegal waste trade for processing. Large-scale exports of electronic waste to China and India from developed countries have led to domestic and international efforts to curb the illegal trade and to channel the waste to regulated recycling companies. The seemingly inevitable rise in bulk hazardous waste is expected to create opportunities for hazardous waste treatment companies as regulations tighten and technological capacity improves.

Figure 1: Key ESG Issues facing the waste sector in Asia



Source: Responsible Research

Social aspects

Waste management is a participative and community-driven process, characterised by a myriad of informal stakeholders including residents, community groups, 'rag pickers' and NGOs. Asian waste companies generally understand the importance of stakeholder engagement from project planning and development to implementation stages. The companies generally focus on engaging communities in upstream activities such as waste segregation and recycling. However, they have limited experience in community investment with defined social goals such as establishing long-term partnerships with local populations to improve income levels. Employee welfare is another high-priority area in which Asian waste companies seem to lag. There is limited information disclosed on health and safety standards, welfare benefits and training programmes. With increased social awareness and greater advocacy for labour rights, companies are likely to face increasing pressure from stakeholders to disclose more information and improve human resource management.

Governance

Corporate governance in Asia's waste sector is generally unimpressive, with key areas of concern being low board independence and limited disclosure on board committees, audit and nomination procedures, and risk management, among others. Such observations are not unique to the waste sector and reforms at the national level will push waste companies to join others to strengthen their corporate governance. With regards to government policy, waste companies can theoretically benefit from favourable policies on preferential electricity tariffs for renewable energy from waste as well as subsidies for capital expenditure on waste infrastructure. To gain maximum benefit from such policies, companies must thoroughly understand the contractual rights and responsibilities in waste projects, which typically take the form of public-private partnerships (PPP). Effective legal, regulatory and policy regimes, timely tariff collection and technical clarity are key enablers of successful PPP arrangements.

This report includes a review of the key ESG issues and solutions that companies are taking to mitigate risks and develop opportunities. Companies that react positively to pressures from environmental regulations, social groups and corporate governance reform or even act as champions of sustainable business practices stand to gain in economies that place increasing emphasis on sustainable growth.

The report also details a benchmarking of ten listed Asian waste companies that are evaluated for their sustainability performance using the ASR™. Four global waste companies are benchmarked

alongside to provide a comparative guide to the performance of the Asian companies. The benchmarking reveals that Asian waste companies lag behind their global counterparts significantly in terms of their sustainability performance. It should be noted that the Asian conglomerates with waste management businesses are not scored in this exercise because the waste business is not a listed entity.



CONTENTS

WASTE IN ASIA

PLEASE CLICK TO ACCESS SECTIONS

4 EXECUTIVE SUMMARY

9 KEY INSIGHTS

13 INTRODUCTION

Investing in Waste
The Basics of Waste
Waste Management Companies in Asia

27 ENVIRONMENT

Overview
Waste Treatment and Environmental Impact
Waste and Recycling
Integrated Treatment Approach
Hazardous Waste Management
Waste and Climate Change

91 SOCIAL

Overview
Waste and Society
Health and Safety
Capacity Building
Community Engagement

137 GOVERNANCE

Governance in Asia
Corporate Governance in the Asian Waste Sector
Corruption
Government Policies
Contractual Relationships

155 CONCLUSION

163 REFERENCES

KEY INSIGHTS

1. Waste infrastructure requires urgent improvements to alleviate the environmental impact of rising waste generation

The pressing need for more and better waste infrastructure is most critical in developing Asia. Poor management of rising waste volume due to population growth, urbanisation and economic development could lead to a 'waste crisis' with long-lasting environmental degradation if there is no corresponding expansion of waste services. Waste treatment facilities such as sanitary landfills and incinerators are most urgently sought, but they demand large capital expenditure and are often inadequately provided by local governments due to financial constraints.

2. Waste as renewable energy is emerging as a central focus in Asia's waste sector

Resource recovery from waste is gaining importance in national waste management strategies across Asia, and the generation of renewable energy from waste is a key focus area. Companies are actively pursuing energy from waste projects, which support political, environmental and energy agendas as well as provide steady income via the sale of electricity. Renewable energy from waste takes many forms, such as landfill gas capture, incineration, refuse-derived fuel and biogas from anaerobic digestion. The shift from landfills to waste-to-energy (WTE) plants represents the dominant transformation in waste treatment. China is pursuing an ambitious national policy of converting 30 percent of its total municipal waste into energy by 2030, while Hong Kong is set to implement a new waste management strategy with waste incineration as the main treatment method. Asian companies are finding new and innovative ways of optimising energy recovery from waste, such as the landfill gas project to replace naphtha in town gas production by SITA Hong Kong and the integrated solid waste treatment facility in Qatar by Keppel.

3. Sustainable waste management reduces greenhouse gas emissions

With a contribution of three to five percent of total global anthropogenic GHG emissions in 2005, the waste sector can do its part to mitigate climate change through sustainable management. Asian companies are active in a variety of Clean Development Mechanism (CDM) projects in waste management, which are eligible for carbon credits based on the scale of GHG emissions reduced. CDM provides the financial support to launch projects that

would otherwise be economically unfeasible, as well as to develop a system of monitoring and transparency to determine long-term emission savings. Landfill gas to energy and biological treatment of waste are the more common projects in Asia. Companies that reach specific environmental and social goals through long-term commitment and partnership with the local community can achieve international certification standards, such as the Gold Standard Voluntary Emission Reduction status that was accorded to China Everbright's Suzhou methane recovery project. This type of global recognition could theoretically reduce a company's cost of capital for subsequent projects.

4. Stricter environmental health and safety standards and legal enforcement are required for hazardous waste

Technical resources and legal enforcement of responsible hazardous waste treatment is lacking in Asia. Illegal dumping of toxic waste by industry threatens environmental and human health and reduces business opportunities for hazardous waste companies. Companies such as Shenzhen Dongjiang, Super Dragons Technology and Shenzhen GEM are investing in research and development (R&D) to improve their technological capability in hazardous waste treatment. The electronic waste (e-waste) crisis in Asia, particularly China and India, is of international concern, as these two countries receive the bulk of illegal e-waste exports to Asia.

5. Recycling is largely an informal sector operation in developing Asia

Recycling in Asia is largely a fragmented 'traders' business made up of informal enterprises. Recyclable materials are perceived as a commodity to be paid for, which makes the business model of large-scale recycling plants financially challenging. Such investments in the developed world usually require a free supply of materials to defray the cost of processing. These market conditions may explain why relatively few Asian waste companies are integrated across recycling and treatment businesses compared to those in the West. One such company is Fook Woo (923:HK), which is integrated across the value chain for paper waste collection, recycling, reprocessing and disposal. Recycling is widely accepted as the preferred option over energy recovery in sustainable waste management and integration of recycling into the formal sector could produce more consistent recycling efforts.

6. Stakeholder engagement and social attitudes must be proactively managed by Asian waste companies

Stakeholder engagement and social attitudes have an overarching influence on the success of waste management systems. Besides working closely with the government, companies must also engage local residents, NGOs, the informal sector and other active participants of the waste community. Private sector involvement in waste is often faced with negative social perceptions such as not-in-my-backyard (NIMBY) attitudes and resentment from the informal sector, which have to be managed through an iterative process of open dialogue, public audit of treatment facilities and a commitment to community investment.

7. Asian waste companies lack comprehensive disclosure on employee welfare indicators

The level of disclosure on health and safety standards, welfare benefits and training programmes for employees is generally low among the companies. Health and safety information is especially critical. Statistics from several developed countries show that the waste sector has a higher rate of injuries than the national average. Capacity building programmes for workers are essential as well in order to raise the productivity of the traditionally labour-intensive and low-skills-based industry. Companies such as UEM Environment and Sembcorp Environment (both unlisted subsidiaries) have taken the lead in reporting on employee statistics.

8. Community investment and partnership strengthen long-term sustainability of waste projects

Asian waste companies are active in seeking community involvement but lack strategic community investment projects which may help drive their revenues and secure their license to operate. Common initiatives include promoting source segregation of waste by households and educational campaigns on recycling. Community investment and partnership is a long-term process full of deliberation that must still be quick to adapt to changing local conditions. Some non-listed waste companies have demonstrated commendable effort through projects that involve the informal sector and provide training and income for local people. Companies can also tap into clean development mechanism (CDM) projects to create social benefits that improve the lives of less advantaged communities.



9. Limited disclosure and low board independence are characteristic of corporate governance in the Asian waste sector

Many of the surveyed Asian waste companies do not provide adequate information on board composition and committees. Low board independence and the non-separation of the roles of Chairman and CEO are common. As corporate governance reform takes place across Asia in the wake of the global financial crisis, the waste sector will benefit from stricter requirements on board quality, financial control and audit procedures.

10. Government policies on renewable energy tariffs and infrastructure subsidies support private sector investment

Many preferential feed-in tariff policies for WTE projects exist in Asia to encourage private investment. Additionally, companies can access specially designated funds set up by national environmental ministries and multilateral development agencies to reduce the cost of infrastructure capital. One example is the economic stimulus package by the Chinese government, which allocated up to 40 percent of the US\$586 million budget to green infrastructure. The Asian Development Bank (ADB) made its first private-sector municipal solid waste project through a US\$200 million loan facility agreement with China Everbright for the development of WTE plants in secondary cities in China.



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13