SECTION 1 – EXECUTIVE SUMMARY

This report intends to contribute to the municipal solid waste dialogue in China. The report provides a general sector background and presents the World Bank's current understanding. Detailed recommendations are made.[1]

The report was prepared using assessments by four consultants hired by the World Bank in 2004[2] and a review of the Asian Development Bank's comprehensive report, completed in 2001, entitled "Strengthening Urban Solid Waste Management: National SWM Strategy (TA3447-PRC)" and compendium report "Public Private Partnerships in Waste Management." Field visits and project reviews were also carried out by Bank staff.

China recently surpassed the U.S. as the world's largest municipal solid waste (MSW) generator. In 2004 the urban areas of China generated about 190,000,000 tonnes of MSW and by 2030 this amount is projected to be at least 480,000,000 tonnes. No country has ever experienced as large, or as rapid, an increase in waste generation. Management of this waste has enormous domestic and international implications. This report presents waste quantity estimates, that are considered to be sufficiently credible for national planning and resource allocation purposes.

Based on current solid waste plans, China could face an 8-fold increase in its country-wide waste management budget between now and 2020 (rising from today's estimate of 30 Billion RMB to about 230 billion RMB). The need for increased budgets will be most severe in smaller cities (those under 1,000,000 people).

Significant improvements have been made in the waste management sector over the last ten years. For example, most larger cities are aggressively moving towards sanitary landfilling as their main disposal option. Improved landfill operations and increased availability is likely China's most pressing waste management need.

Even though the pace of China's solid waste improvement is significant, China has been unable to keep up with the growing demand for waste service coverage, environmental requirements for safe disposal systems, and rationalization of cost-effectiveness in service delivery.

China's waste management practices now have global impacts. For example, secondary materials prices in the U.S. are now influenced by China's demand for these materials. The MOC's goal of increasing the rate of waste incineration to 30% (up from the current 1%) would likely at least double the global ambient levels of dioxin.[3]

This report identifies critical solid waste management issues for China:

1. Waste Quantities: unsurpassed rate of growth in waste generation, dramatically changing composition, and minimal waste reduction efforts;
2. Information Availability: lack of reliable and consistent waste quantity and cost data makes planning for waste management strategies extremely difficult;
3. Decision-Making Process: lack of consistent policy and strategic planning toward technology selection, private sector involvement, cost recovery, inadequate public access and participation in the planning process;

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1. This report does not address the key areas of hazardous waste, medical waste, sewage sludge, or waste pickers. Recommendations for follow on work in these areas are made.

2. InterChina Consulting—A Review of Waste Management Activities in Chinese Cities; AMEC Earth and Environmental—Review of Waste Quantities and Composition in China; Gabriella Prunier—A Review of Private Sector Participation in China Waste Management Sector, and; Environmental Resources Management—CDM Umbrella Guidelines for MSW in China. All prepared in 2004 and all available from the World Bank.

3. Dioxin is a highly toxic persistent organic pollutant; total global loading is a concern locally and globally.

4. Operations: facilities do not always meet design standards, particularly in pollution control, and facility operations are deficient, waste collection operations are often not rationalized;
5. Financing: inadequate cost recovery through user charges and tipping fees;
6. Institutional Arrangements: inadequate decentralization of collection and transfer services, inadequate municipal capacity for technology planning and private sector involvement, and inadequate clarity on mandates between government agencies, e.g. MOC and SEPA, and inadequate delineation between central and local government responsibilities.
7. Private sector involvement: The government's goal of increased private sector participation in solid waste services is hindered by unclear and inconsistent 'rules of engagement', non-transparent purchase practices, non-sustainable subsidies, inadequate municipal cash flows, unclear and inconsistent cost accounting practices, and an unclear regulatory framework.
8. Carbon financing: Increasing in importance in the Chinese MSW sector. China's cities could generate as much as $ 1 Billion per year from sale of carbon emissions reductions, resulting from landfill gas recovery, composting, recycling, and anaerobic digestion.[4] The opportunity may however be time limited so quick interventions are needed.

The report makes many recommendations (Section 8). The key recommendations discussed in detail in Section 8 are:

- Encouraging 3 cities to act as 'pilot' or 'model' cities to introduce replicable sustainable models. The pilot should aggressively pursue waste minimization strategies, generate credible and comprehensive waste management data (especially costs and quantities), and serve as 'centers of excellence' for waste management technologies, policies, and training in China. The pilots should provide a venue to develop long-term management plans, i.e. over 20 years.
- China needs to move up the hierarchy of waste management, achieving more waste reduction, reuse, recycling, and recovery (composting and digestion), and thus minimize the amount of waste that needs to be disposed.
- Waste minimization should be a key priority to MSW planning in China. Particular emphasis is needed for the organic fraction of the waste stream (which will continue to be more than 50% of the total waste stream for the foreseeable future), and paper (which is likely the fastest growing component in the waste stream). Packaging waste should also be targeted as it represents a large fraction of the increase in waste volume.
- Consistent national policies on MSW legislation are needed. The policies should encourage cross-jurisdictions and inter-agency coordination, and facilitate implementation of economic instruments for improving waste management.
- An integrated sustainable waste management approach with a long-term objective of waste segregation is needed. This approach involves key stakeholders in the planning and decision-making process and takes a holistic view of the entire waste management system, including waste minimization, collection, transfer, treatment, recycling, resource recovery, and disposal. Important planning and decision criteria include; social, cultural, environmental, institutional, financial and technical.
- The recycling industry needs to be improved (more professionalization, improved product standards, market development, and better operating standards).

4. Based on a sale price of $4.50 per tonne and a maximum diversion rate of 50% LFG recovery and 10% composting levels. Excludes the potential ERs from recycling or energy savings/production.

- Composting may increase in importance (possibly encouraged by the sale of carbon emission reductions), however product marketing requires that compost quality be reviewed and marketing programs established.
- Incinerators in China are growing in popularity but their growth is often driven by artificial and non-sustainable subsidies and non-transparent financing structures, as well as a lack of understanding and experience about incineration facilities. All new incinerators should meet Japanese-EU emission standards for dioxin and mercury and all should have a sufficient level of operator training. In all cases complete and accurate cost-benefit analyses should be performed.
- Landfills need urgent attention to improve overall operating conditions. They need to be sloped to minimize leachate, developed in stages, and operated according to international standards for "sanitary landfills." More attention is needed on post closure uses of landfills, i.e. seen as an integrated and needed land use – maybe turned into golf courses or green spaces upon closure, (as part of urban planning and development). Chinese cities will likely need an additional 1400 landfills over the next 25 years.
- Increased planning and service provision is needed for "special wastes" such as hazardous waste, demolition waste, medical waste and disproportionately problematic wastes such as batteries, disposable diapers, single serving beverage containers, newspapers.
- "Brownfields" – lands contaminated from inadequate disposal practices or chemical spills – will grow in importance in Chinese cities as they continue to impact public health, environmental quality, and land values. There are likely at least 5,000 of these sites now in Chinese cities. The cost to clean up these sites will always be significantly higher than the cost to have to disposed of the waste properly in the first place. This is an area poorly understood in China and in need of deeper review.