

EXECUTIVE SUMMARY

Each year Hong Kong must dispose of mountains of waste. Total waste disposal in Hong Kong in 1999 was 8,126,000 tonnes. More than two-thirds of the domestic, commercial, and industrial materials disposed that year were comprised of paper, plastics, and putrescibles – materials that can be recycled or composted. Instead of focussing on the opportunities for cost-saving and job creation offered by recycling and composting these materials, the Government, however, has proposed building incinerators that will trade these opportunities for higher costs, substantial pollution, and environmental degradation.

Dwindling disposal capacity has become a pressing concern for Hong Kong. According to the Government reports, landfill capacity in the Region will be exhausted in 2015 or sooner. In order to address long-term waste management needs, the Environmental Protection Department (EPD) developed a "Waste Reduction Framework Plan." It states, "[w]e need to transfer emphasis from collecting and transporting waste to landfills for disposal to waste prevention and reuse of waste materials." To that end, numerous efforts in support of increased recycling have been implemented by Governmental agencies.

However, a look at current and planned spending for waste management activities reveals the Government's true priorities. In 1999, the Government's recurrent expenditure on waste management was \$1.5 billion. This does not include capital costs. Between April 1989 and March 2000, the Government invested more than \$10.2 billion in new waste management facilities. In order to address future disposal needs, the Government has reserved \$9,780 million of its Capital Works Reserve Fund for the development of two waste-to-energy incinerators with an overall capacity of 6,000 tonnes per day. Based on costs of similar incinerators around the world, the annual net cost to operate these incinerators will be an additional \$600 million. Furthermore, landfills will still be needed to handle residues from the incinerators, materials that are not suitable for burning, and waste production in excess of the incineration capacity.

In contrast to the billions of dollars the Government spends (and is planning to spend in the future) on waste disposal each year, Government investment in waste reduction, reuse, recycling, and composting is minimal. The Environment and Conservation Fund, a principle source for funding of waste reduction projects, received an initial \$50 million of capital upon establishment in 1994 and another \$50 million injection in 1998. The Government has touted its proposed 2002 injection of an additional \$100 million into the fund as a significant milestone. In summary, the Government's stated policy priorities and its spending priorities are exactly opposite.

In addition to consuming billions of dollars, development of waste-to-energy incineration facilities would create additional environmental pollution without creating a long-term solution for waste management. Waste incinerators can appear to be the answer to the problem of ever-increasing waste disposal. But to paraphrase Dr. Paul Connett, if incineration is the answer, you have asked the wrong question.

Municipal waste incineration is **not** safe, it is **not** cost-effective, it is **not** sustainable, and it does **not** create net energy gains for society.

Incinerators are major – and in many areas the largest – sources of such pollutants as dioxin, lead, and other heavy metals released into the environment. Incinerators also release carbon monoxide, oxides of sulfur and nitrogen, hydrocarbons, and particulates into the air. Modern incinerators with sophisticated pollution control equipment trap some of the toxic metals in the fly ash – the residue captured by the pollution control devices. Ironically, this means that the better the air pollution control, the more toxic the ash.

Furthermore, creation of incineration capacity would most likely lead to sustained wastefulness in Hong Kong's society. Incinerators need a minimum amount of garbage daily to operate properly and generate electricity. Because of their voracious need for discards for fuel, incinerators lock up the waste stream. They encourage increased product consumption and waste generation. They discourage waste reduction and sustainable methods of production and consumption. In addition, communities with incinerators still need landfills for ash disposal and for by-pass wastes. Ash can comprise about 25% by weight of an incinerator's throughput and must be landfilled. Thus, incineration means incineration plus landfill.

Describing an incinerator as a “resource recovery” or “waste-to-energy” facility is misleading. Incinerators recover few resources (with the exception of ferrous metals) and represent a net energy loser when the embodied energy of the materials burned is included in the accounting. When a ton of paper is burned for its heating value, it generates about 8,200 megajoules. When this same paper is recycled, it saves about 35,200 megajoules. Recycling other items typically present in MSW offers similar energy savings. Therefore, **incinerators waste energy** rather than turn waste into energy.

Greenpeace and the Institute for Local Self-Reliance (ILSR) propose Hong Kong radically change the focus of its system for handling discarded materials. This report details a blueprint for "zero waste" in Hong Kong. Critical components include programs and policies designed to:

- Reduce generation of discards (source reduction);
- Increase product reuse and repair;
- Create a source separation system for domestic, commercial, and industrial discards and construction and demolition debris;
- Establish an efficient collection system for separated materials;
- Support processing and market creation for recyclables; and
- Create composting systems for organic materials.

Greenpeace and ILSR believe that implementation of the programs proposed could result in reducing disposal needs to approximately 7,000 tonnes per day by the year 2011. This represents a greater disposal reduction than the Government proposed in its "Waste Reduction Framework Plan." Furthermore, these reductions would be

achieved without relying on incineration.

In order to develop cost comparisons of the Greenpeace/ILSR proposal, ILSR developed a model of costs based on EPD data and estimated costs for proposed programs. This model compared costs for four scenarios:

- Landfill disposal alone for all waste generated;
- Development of 6,000 tonnes per day incineration capacity with landfilling of the remaining waste stream and incineration residuals;
- Development of 6,000 tonnes per day incineration capacity, waste reduction of 20% by the year 2010, and landfilling of the remaining waste stream and incineration residuals; and
- Full implementation of the Greenpeace/ILSR program.

The comparison of total operating costs for the waste management scenarios shows that the Greenpeace/ILSR proposal has the lowest costs in the long-term. Capital costs for the Greenpeace/ILSR proposal were also the lowest among all alternatives considered. The Government has reserved a staggering \$9,780 million of its Capital Works Reserve Fund for the development of waste-to-energy incinerators.

In contrast to the Government's incineration plans, with a capital cost of \$9.78 billion, the capital costs of implementing the Greenpeace/ILSR proposal will be much lower, at less than \$2 billion. At the bottom line, ILSR estimates cumulative expenditures for implementation of the proposal from the years 2002 through 2011, would be \$8 billion cheaper than a landfill-only waste management scenario and \$11 billion cheaper than implementation of the Waste Reduction Framework Plan. Implementation of the Greenpeace/ILSR proposal would also decrease environmental and health effects from air and water pollution, reduce greenhouse gas production, conserve energy, create and sustain thousands of jobs, and encourage product manufacturers to market products which are less wasteful and/or easier to recycle.

For example:

- Fewer emissions originate at factories using recycled feedstock than at factories using virgin material. Recycling paper cuts air pollution by about 75%. Substituting steel scrap for virgin ore reduces air emissions by 85% and water pollution by 76%.
- Recycling reduces net emissions of greenhouse gases as compared to landfilling or incineration. For example, when using the extraction of raw materials as a reference point, recycling of 1,000 tonnes of newsprint reduces greenhouse gas emissions by 418 MTCE, whereas incineration of the same newsprint increases greenhouse gases by 286 MTCE and landfilling produces 275 MTCE.
- It takes 60% less energy to manufacture paper from recycled stock than from virgin materials.
- Sorting facilities for mixed recyclables sustain an average of 12 times as many jobs as maintained at landfills and incinerators handling the same amount of materials.

- A Japanese researcher reported that three out of five companies interviewed said that the enactment of Japan's Specified Household Appliances Recycling (SHAR) Law was a strong incentive for them to consider the environmental impact of their products.

Greenpeace and ILSR acknowledge that our proposal is very ambitious. However, it is not unattainable. Numerous jurisdictions in the U.S. and around the world have achieved impressive diversion levels for municipal solid waste (MSW). In the U.S., during 1996, Seattle, Washington diverted 44% of its MSW from disposal; Portland, Oregon diverted 50%; and Bergen County, New Jersey diverted 54%. The residents of Mokattam, Cairo, divert 90% of the trash they collect. Curitiba, Brazil, recycles two-thirds of its garbage. A neighborhood participating in the Advanced Locality Management program in Sahar, Andheri, Mumbai, India, reduced their garbage disposal by half within two years. Each of these jurisdictions has implemented some of the diversion programs proposed in this report but none has implemented the entire range of programs. We believe that if Hong Kong does so, it will not only be able to reduce its waste disposal to 7,000 tonnes per day cost-effectively by 2011, it will become a model for the rest of the world.