City of Kawartha Lakes

Future Waste Options Study

The City of Kawartha Lakes retained Dillon Consulting to undertake a Future Waste Options Study (Study) to explore the different ways Kawartha Lakes can manage garbage into the future. Garbage is waste that can't be diverted from disposal through reduction, reuse, composting, or recycling. What's in the garbage bag today will not look the same in the future because packaging changes and new diversion programs are available. Currently the City is diverting almost 40% of waste from landfill. Even when the City reaches its goal of diverting 70% of waste (refer to Making Waste Matter plan), the City will still have to manage the garbage that remains.

Project Overview

The Study involved reviewing and evaluating different ways to manage the City's garbage, which included both landfill-related and alternative technology options. Nine options were evaluated that considered the potential environmental and social impacts and economic feasibility. Landfill expansion of an existing City-owned landfill site(s) was identified as the preliminary preferred option.

Options Overview

In the next section, we describe each option including assumptions on how it would be implemented in Kawartha Lakes and the associated advantages and disadvantages.

Special Note On Options:

Each option, unless otherwise stated, assumes the facility would be located within the City of Kawartha Lakes and manage between 40,000 and 60,000 tonnes of garbage each year from residents and businesses within Kawartha Lakes. This amount assumes that the City continues to increase the amount of waste diverted into the future.

Mixed Waste Processing

A process that extracts recyclables, organics, and/or reusable materials from garbage. Extracted materials are removed through manual sorting and/or the use of equipment.

How would the option be implemented in Kawartha Lakes ?

The City would construct a mixed waste processing facility to extract high value recyclables and organics remaining in the garbage.

Diversion programs would continue and broaden over time.

Garbage remaining after processing will need to sent for final disposal (e.g., landfill).

The facility will be designed and operated to meet environmental regulations.

Advantages

Extracts divertable materials still in the garbage stream and reduces the amount of waste sent to landfill.

This type of facility is proven.

Disadvantages

Higher costs (siting process and land acquisition required).

Estimated to take up to five years for siting, approval, design, and construction of a facility.

City does not have experience owning or operating this type of facility.

Mass Burn Incineration

Garbage is burned in a controlled facility and the heat that is created generates energy. Two types of ash come out of the process: bottom ash can potentially be reused in applications like road reconstruction or disposed in a non-hazardous landfill site and fly ash requires disposal in hazardous landfill site.

How would the option be implemented in Kawartha Lakes ?

The City will construct a waste-to-energy facility that recovers metals and energy from burning the garbage.

Bottom ash is beneficially reused, and fly ash will be disposed of in a hazardous waste landfill.

The facility will be designed and operated to meet environmental regulations.

Advantages

Reduces the volume of garbage sent to a landfill thus extending its life and delaying the need to find a new landfill site.

Potential for reduced greenhouse gas emissions due to the generation of renewable electricity.

Potential revenue from energy generated.

Proven technology in Canada and worldwide.

Disadvantages

An Environmental Assessment may be required which can be a lengthy process

Costs are anticipated to be high (e.g. siting process, land acquisition etc.)

Gasification

A process that turns garbage into a gas form (called syngas) at high temperatures without burning. The syngas can be used as fuel.

How would the option be implemented in Kawartha Lakes ?

The facility will process garbage to recover high value recyclables and/or energy.

The facility will be designed and operated to meet environmental regulations.

Advantages

Generates electricity and/or heat.

Reduces the amount of garbage sent to a landfill thus extending its life and delaying the need to find a new landfill site.

Potential to reduce greenhouse gas emissions.

Disadvantages

Gasification is an emerging technology for managing municipal garbage and pilot projects have not been successful. Therefore, there's a high level of risk.

Uncertainty with approvals process because technology has not proven successful.

Costs are anticipated to be high (siting process and land acquisition required).

Pyrolysis

Involves heating garbage in an oxygen-free environment to produce a gas or liquid product and a carbon char residue.

How would the option be implemented in Kawartha Lakes ?

It is assumed that the facility in which pyrolysis takes place would process garbage and recover recyclables and/or energy.

The facility will be designed and operated to meet environmental regulations.

Advantages

Generates electricity and/or heat.

Reduces the amount of garbage sent to a landfill thus extending its life and delaying the need to find a new landfill site.

Potential for reducing greenhouse gas emissions.

Disadvantages

Pyrolysis is at a pilot stage for managing municipal garbage.

Therefore, there's a high level of risk.

Uncertainty with approvals process because this technology has not proven successful.

Higher costs (siting process and land acquisition required).

Landfill Expansion

Increasing the size of an existing City landfill site(s).

How would the option be implemented in Kawartha Lakes ?

A City-owned landfill can be expanded vertically and/or horizontally. A vertical expansion would be within the current property boundary and investigations would be required for horizontal expansion.

Advantages

Minimal change in costs as current staffing levels and equipment can be used.

Fewer landfills for the City to manage offers the potential for cost savings.

Low risk given the City is very familiar with this option and this is the most common disposal approach in Canada.

Potential to create more landfill gas which can produce more energy.

Disadvantages

Lengthy approvals (including Environmental Assessment) and permitting process which could take 10 years to complete.

This option will not reduce the quantity of waste diverted from landfill.

Develop a New Landfill

The City develops a new landfill site within Kawartha Lakes.

How would the option be implemented in Kawartha Lakes ?

The City will complete a siting study to identify a new location for the new landfill.

Advantages

Minimal change in costs as current staffing levels and equipment can be used.

Fewer landfills for the City to manage offers the potential for cost savings.

Potential to create more landfill gas which can produce more energy.

Disadvantages

Higher costs (siting process, approvals, and land acquisition required). A new landfill will increase traffic and visual impacts in a new area.

Development of a new municipal landfill site has not occurred in decades.

High potential for opposition from the public and stakeholders.

This option will not reduce the quantity of waste diverted from landfill.

Landfill Mining

Previously landfilled garbage is excavated to recover valuable recyclable materials, space and/or improve environmental conditions.

How would the option be implemented in Kawartha Lakes ?

The City would mine garbage at an active City landfill site to extract materials for reuse and/or recycling and add air space for future landfilling.

Advantages

Costs are relatively low to rent equipment for mining activities.

Mining uses an existing landfill site and will create more airspace.

Disadvantages

Potential for increased nuisances (odour, litter, dust) from mining activities.

Uncertainty about what materials will be uncovered during mining and exposing previously buried garbage will likely result in a short-term release of greenhouse gas emissions.

Exporting waste out of the City

Garbage is hauled to a disposal facility outside of Kawartha Lakes.

How would the option be implemented in Kawartha Lakes ?

The City would upgrade a building at the Lindsay Ops Landfill site to combine garbage collected from curbside trucks and drive it to a facility located within Ontario.

Advantages

The City will not be responsible for the waste after it is driven to a disposal facility.

City staff are familiar with this type of operation.

Other municipalities export waste outside their municipal borders.

Disadvantages

Greenhouse gas emissions will increase due to longer driving distances.

This option will not reduce the quantity of waste diverted from landfill.

Privatization of City facilities

Privatization options include hiring an outside company to operate the landfill site(s), selling the City's landfill site(s) or using privately owned landfills.

How would the option be implemented in Kawartha Lakes ?

The City sells a landfill site to a company which will own and operate the landfill. The City sends its garbage to this facility.

Advantages

Increase in costs for tipping fees will be offset by a decrease in costs required to manage a landfill site.

Private company will assume expenses and responsibility.

Disadvantages

This option will not reduce the quantity of waste diverted from landfill.

Potential lack of flexibility, limited control on tipping fees, and loss of assets.

Evaluation Result

Evaluation results are shown in figure 1. Environmental impacts are shown in green, social impacts in yellow, and economic feasibility in blue. The best possible scores for each of the evaluation criteria is three (3) and the best possible overall score is nine (9).

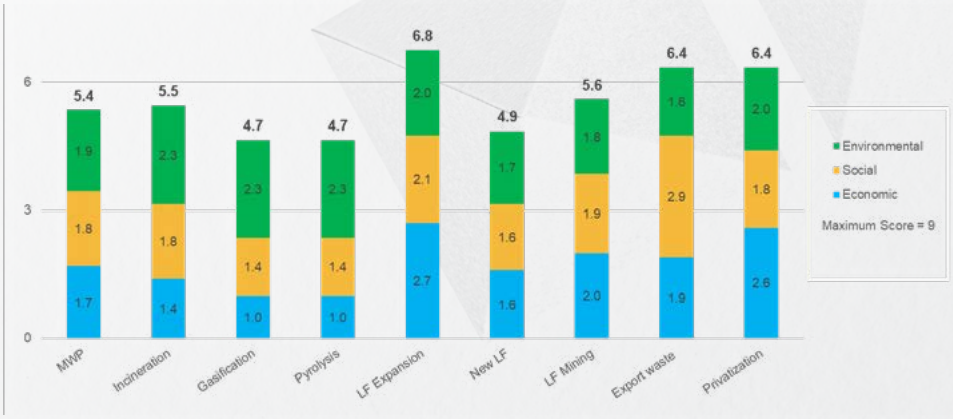

Figure 1: Table Showing Evaluation Results.

The results show that the highest scoring (most favourable) option is Landfill Expansion, which scored a 6.8. The second most favourable options are Exporting Waste and Privatizing City Facilities, which both scored 6.4. The two least favourable and lowest scoring options are Gasification and Pyrolysis—both scored at 4.7.