

## LETHBRIDGE WASTE AND RECYCLING CENTRE Waste to Energy Summary

In March of 2006 the Recycling Council of Alberta released a report titled "Municipal Solid Waste (MSW) Options: Integrating Organics Management and Residual Treatment/Disposal. The following information was summarized from the report and the Thermal Treatment Presentation from the subsequent MSW Options Workshops held in Toronto and Calgary. The full report and all presentations are available for further information by going to the following web link.

[http://www.recycle.ab.ca/index.php?option=com\\_content&task=view&id=35&Itemid=161](http://www.recycle.ab.ca/index.php?option=com_content&task=view&id=35&Itemid=161)

The report provides evaluations of organics management and residual treatment/disposal options including:

- Composting;
- Anaerobic digestion;
- Sanitary landfill;
- Bioreactor landfill; and thermal treatment.

**The Executive Summary in the report cited the following key findings with respect to thermal treatment:**

- *Thermal processes significantly reduce the amount of material requiring landfill disposal. Typically, 90% by volume and 70-75% by weight.*
- *Thermal processes provide the opportunity to recover renewable energy from waste materials. Typically, 450 to 500 kWh of electricity per tonne of waste processed. If a suitable heat load is available, an equivalent amount of heat can be recovered in addition to the electricity.*
- *Given the size of communities considered in this study, starved air or multi-stage incinerators are likely the most appropriate thermal treatment technology. For the smallest communities, batch process systems are likely the most appropriate.*
- *New and emerging technologies such as plasma gasification are generally not yet commercially available or proven on a full scale.*
- *Thermal treatment is a costly waste treatment alternative and comparable to anaerobic digestion. It is more costly than landfill disposal. Generally, larger facilities are less costly on a per tonne basis. Any municipalities considering thermal treatment should consider partnering with neighbouring municipalities in order to build a large facility and obtain cost savings through economies of scale.*
- *Three alternative waste management systems considered: Baseline – after removal of recyclables, all residual waste proceeds to thermal processing; Source Separated Organics – in addition to recyclables, source separated organics are diverted from the baseline stream and the remaining residuals are thermally processed; and Mixed Waste – the baseline stream is composted or digested and the remaining residuals are thermally processed. These alternative systems generate significantly different quantities of materials requiring disposal from a given size of municipality. On the other hand, there is relatively little difference in the energy content of material resulting from these three alternative systems.*
- *Thermal treatment facilities can be sited, as a compatible land use, in an industrial area. This significantly reduces the social impact associated with siting these types of facilities.*
- *People tend to be concerned about the air emissions from thermal treatment facilities. With the utilization of start-of-the-art air pollution control technology, these emissions are far lower than they were historically and far lower than from many other industrial facilities.*

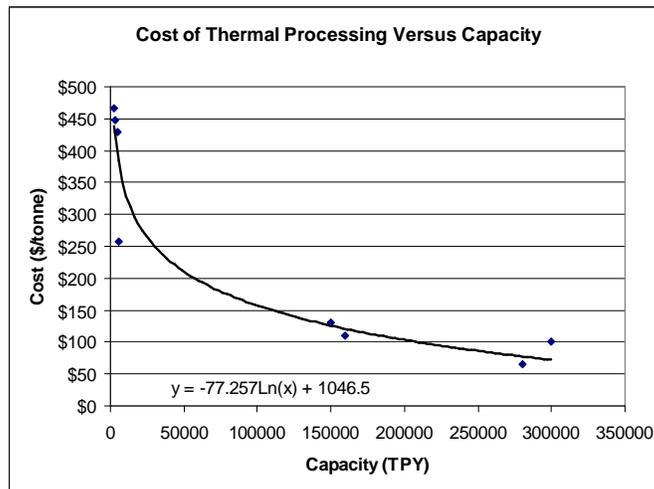
- Depending upon the assumption made with respect to waste composition and the ability of a landfill to sequester carbon, thermal treatment can serve to reduce greenhouse gas emissions compared to landfill.
- Thermal treatment generates more emissions of air contaminants compared to landfill. On the other hand, landfill generates more contaminants to water than thermal treatment.

**The role of thermal treatment is seen as:**

- Waste to Energy (WTE), rather than energy to waste;
- Waste volume reduction, preservation of landfill space;
- Destruction of contaminants;
- Enhancing diversion potential;
- Reducing waste transportation requirements;
- Last treatment of waste before land disposal
- Applied after recycling, organics management;
- Recovers remaining energy;
- Converts energy to heat;
- Electricity can be sold to the grid

**The report provided the following information with respect to costs of WTE**

- The smaller the WTE plant the higher the costs\
  - 10 TPD, or 3000 TPY: \$459 per tonne
  - 20TPD, or 6000 TPY: \$260 per tonne
  - 480 TPD, or 150,000 TPY: \$130 per tonne
  - 100TPD, or 300,000 TPY: \$100 per tonne



Data from MWIN Report:  
 Municipal Solid Waste Options: Integrating Organics Management and Residual Treatment/Disposal, March 2006  
 Published on Recycling Council of Alberta website

**The opposition and hurdles to WTE include:**

- Negative public perception
- Lack of public awareness of technology progress and highly regulated standards
- Large initial investment needed
- Higher operating costs than most local landfills
- Need for long term waste supply contracts

### **Current use of incineration in Canada**

- Burnaby, BC: 280,000 TPY, mass burn
- Quebec City, QC: 280,000 TPY mass burn
- Algonquin Peel, ON: 150,000 TPY, multiple unit modular
- Wainwright, AB: 6,000 TPY, single unit modular