



Business and Financial Assessment of Municipal Solid Waste Management in Greater Vancouver

Presented to Vancouver Board of Trade
July 23, 2009

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Introduction

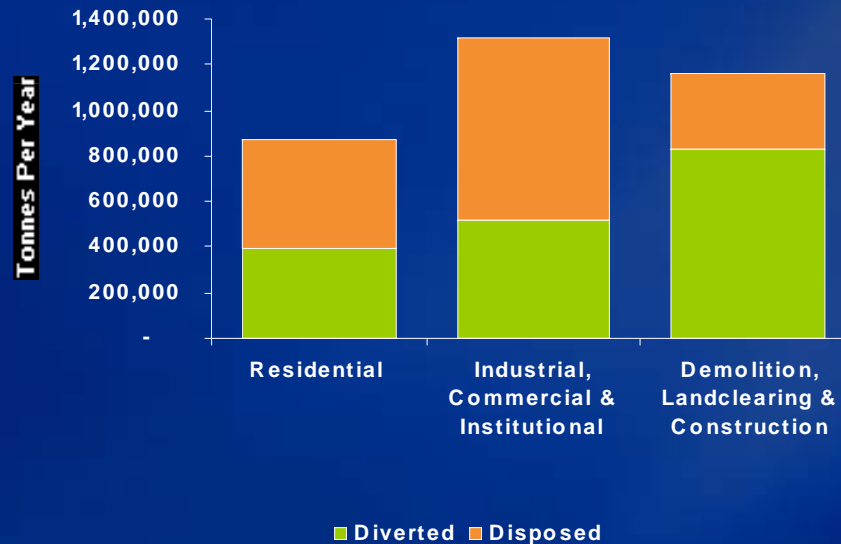
- ◆ **A review of the recently released report by AECOM for Metro Vancouver raises significant concerns that insufficient work has been done to make a decision on the future of waste management in the Lower Mainland, including an apparent preference for a waste to energy solution**
- ◆ **The balance of this presentation provides:**
 - Background on the waste management issue in MV
 - Discussion of the appropriate framework for decision-making
 - Application of this framework to the current situation



Background

Background

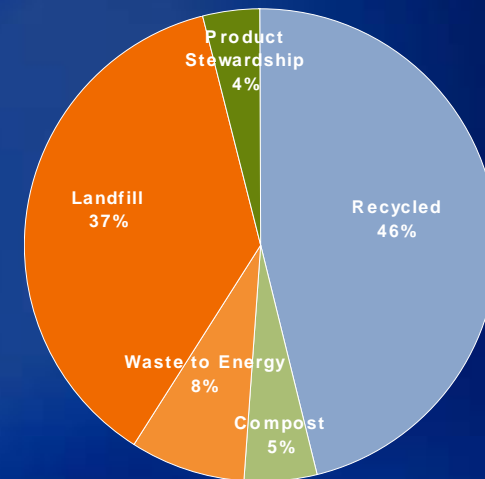
- ◆ The Greater Vancouver region generates about 3.4 million tonnes of waste per year.



- ◆ Business will incur more than half of the additional costs associated with alternate management practices

Background

- ◆ The region currently diverts 55 % of the waste stream (significantly above the national average)
- ◆ The regional goal is to increase the rate of diversion to 70 percent by 2015 (“Zero Waste”)
- ◆ Work by Dr. Morris suggests it is possible to achieve diversion of over 80%, which could affect the relative economics of the residuals disposal options being considered

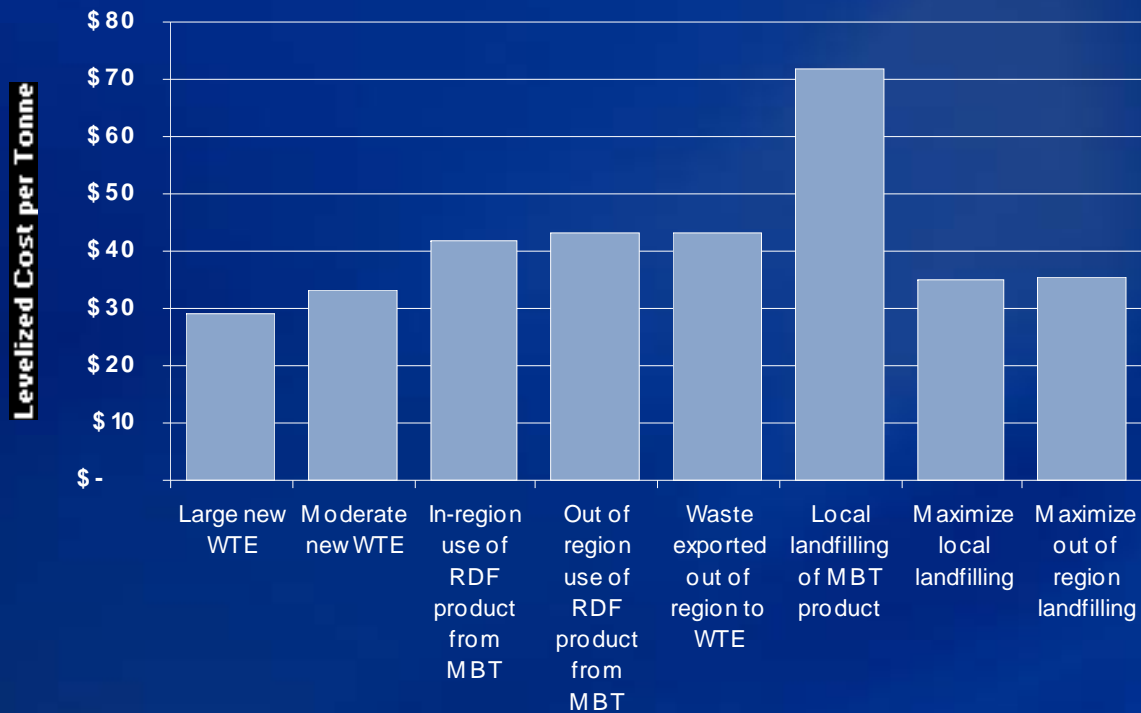


Background

- ◆ **Metro Vancouver engaged AECOM to undertake a comparative analysis of options for management of waste after diversion. The report examined the “relative characteristics and merits” of three means of processing or disposing of waste:**
 - Mechanical biological treatment (MBT)
 - Waste to energy (WTE)
 - Landfilling

Background

- ◆ The results of the AECOM analysis indicate a relative preference for new WTE facilities – at a capital cost exceeding \$700 million



Background

- ◆ **A comprehensive and detailed analysis of the options was not conducted:**
 - No consideration of status quo (Cache Creek)
 - Risk analysis of the options was not conducted
 - The criteria against which the options have or should be considered were not brought together in a manner to facilitate comparison of the options
 - The financial analysis is high level and not based on detailed, project specific costs

Background

- ◆ **Based on our preliminary review of the AECOM report, we are concerned:**
 - Capital costs appear to be low for the WTE options
 - Operating and maintenance costs appear to be low
 - Revenue assumptions for energy appear to be optimistic
 - No estimate of impact on rates charged to business or residents
 - The report mixes public and private sector financing without consideration of the implications



Analytical Framework

Framework for Detailed Evaluation

- ◆ **Prior to making a fully-informed decision on the appropriate option or combination of options, more detailed analysis of the options is required**
 - Detailed financial analysis
 - Risk assessment
 - Assessment of non-financial matters (multi-criteria analysis)
- ◆ **These frame what we should expect to see with respect to a business case for such a significant investment**



Risk Analysis

The Role of Risk Analysis

◆ Risk analysis involves a process of:

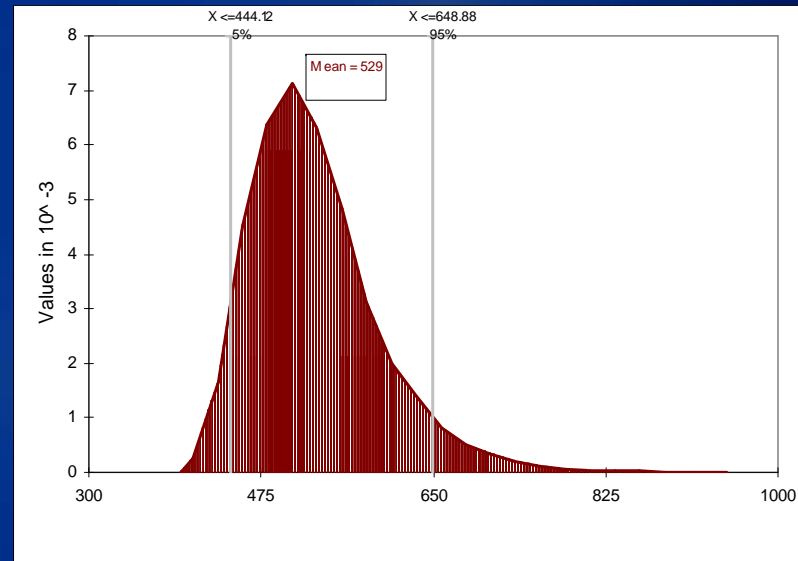
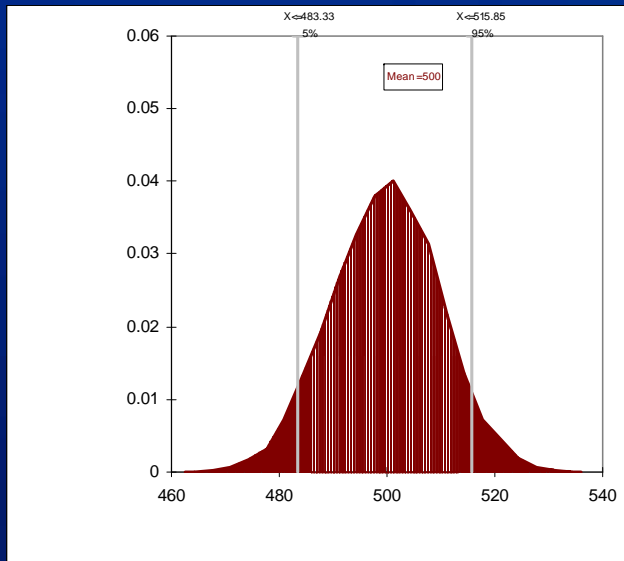
- Identifying risks
- Assessing probability and impact of risks
- Quantifying exposure to unexpected outcomes

◆ Risk analysis is used to

- Determine the incremental risks associated with different courses of action
- Develop a risk-adjusted financial estimate (capital cost, operating cost and revenue) for the options
- Develop a plan to manage risks

Risk Analysis and Impact on Financial Analysis

- ◆ Projects with higher risks show a wider range of potential outcomes in terms of cost as illustrated below



- ◆ The options evaluated in the AECOM report generally have a higher risk profile than existing landfill technology, but these have not been reflected in the financial analysis

Risks of Waste Disposal

- ◆ **The costs of existing landfill practices are generally known and predictable. Costs will likely be consistent with current experience**
- ◆ **The costs of new technology developments for WTE and MBT are harder to define and significant risks exist that need to be accounted for in the costing**

Risks of Waste Disposal

- ◆ **The David Suzuki Foundation, in conjunction with a number of other groups, has recently published a fact sheet on the costs and risks of municipal waste incineration. The risks include:**
 - Changes in waste composition
 - Changes in waste volumes
 - New regulatory requirements
 - Future cheaper alternatives
- ◆ **These all apply to the options being considered by Metro Vancouver**

Risks of Waste Disposal

◆ Potential risks include

- Energy (district heat and electricity) market risks (rates, size, seasonality and availability of markets)
- Regulatory risks (emissions control technology may need to be upgraded on a continual basis)
- Design (site considerations)
- Construction (costs and timing)
- Performance (does the technology work as planned – emissions, energy production)
- Public acceptability
- Environmental (potential for negative environmental impacts)

◆ These are all considerations in major projects/initiatives such as is contemplated

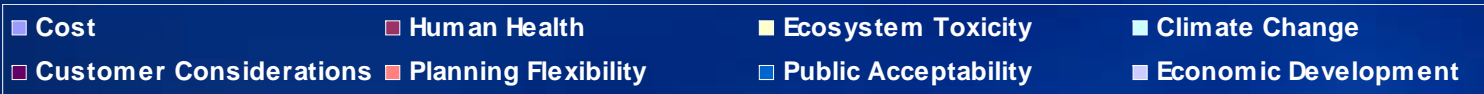
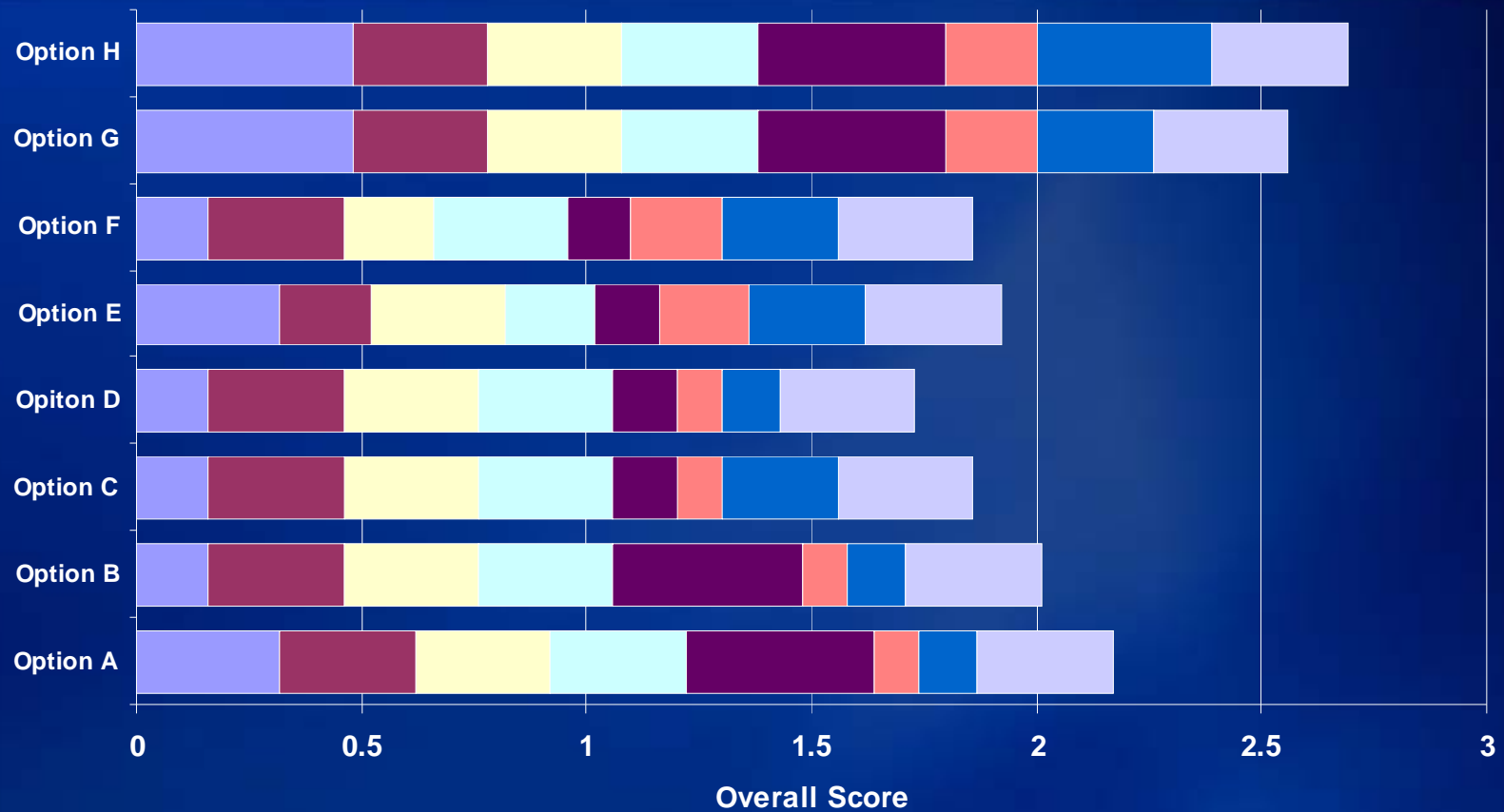


Multi-Criteria Analysis

Multi-Criteria Analysis

- ◆ **Multi-Criteria Analysis (MCA) is a tool to present the evaluation of options against a set of criteria, where the results may not all be readily quantified or they cannot be simply added together**
- ◆ **MCA requires assessing the options against each criteria, and determining the appropriate weighting of each of the evaluation criteria**
- ◆ **The relative rankings and the weightings are then used to arrive at the preferred solution**
- ◆ **Commonly used in public sector decision-making processes**

Multi-Criteria Analysis Illustration



Evaluation Criteria

- ◆ We have identified a number of criteria against which the options should be considered, including:
 - Financial
 - Human health
 - Ecosystem toxicity
 - Climate change
 - Operational flexibility
 - Social/public acceptability
 - Customer considerations
 - Public policy compatibility
 - Economic development

Financial Considerations

- ◆ **There needs to be a comprehensive and balanced comparison of the options**
 - Detailed assessment of the costs and revenues of the options
 - Adjusted for expected value of risks
 - Competitive neutrality (public versus private investment)
- ◆ **Compare to the status quo**
- ◆ **This has yet to be undertaken**

Environmental Considerations

- ◆ Jeff Morris has talked about human health, ecosystem toxicity and climate change impacts
- ◆ **The AECOM report reaches much different conclusions than other studies – this is a concern**
- ◆ A question remains – how do you judge these?

| Parameter | Unit | Landfill Scenario | WTE Scenario |
|-----------------------|--------------|-------------------|--------------|
| Nitrogen Oxide | g/tonne MSW | 470 | 190 |
| Sulphur Oxides | g/tonne MSW | 56 | 84 |
| Carbon Monoxide | g/tonne MSW | 6100 | 90 |
| Particulate Matter 10 | g/tonne MSW | 13 | 3 |
| Mercury | mg/tonne MSW | 0.347 | 31.9 |
| Cadmium | mg/tonne MSW | -0.024 | 4.11 |
| Lead | mg/tonne MSW | 6.46 | 48.56 |
| Dioxins | g/tonne MSW | 0.019 | 0.032 |

Source: The Sheltair Group, 2008, Environmental Life Cycle Assessment of Solid Waste Management: Evaluation of Two Waste Disposal Scenarios for the Metro Vancouver Region

Operational Flexibility

- ◆ **Are we limiting future options that may prove to be advantageous by pursuing a particular option now?**
 - New technologies
 - Further opportunities for diversion (to 82% or more as suggested by Dr. Morris)
 - Lower costs
- ◆ **Is there a way to keep our options open, at least in the short term? – this does not appear to have been considered**

Operational Flexibility

- ◆ **Deferring an incineration solution may be cost-effective and allow for future flexibility**
- ◆ **A simplified comparison of AECOM's Incineration Option and the Out-of-Region Landfill Options**
 - Incinerator CAPEX - \$705 million
 - Interest cost of \$39 million per year or \$52 per tonne
 - Operating costs equal energy revenue
 - Collection and transfer station costs common to all scenarios
- ◆ **Net cost of incineration (\$52 per tonne) is nearly 50% higher than AECOM's landfill example (\$35 per tonne)**
 - **Cheaper to continue to landfill**

Social/Public Acceptability

- ◆ **Is the region generally amenable to incineration?**
 - Is there a risk that public opposition could derail or postpone plans for incineration?
- ◆ **Can WTE plants be located in optimal locations for district heating?**
 - Will this have an impact on economics?
- ◆ **Are landfills an appropriate use of land?**
 - Are there better uses of the land?
- ◆ **What is the acceptability of shipping waste out of the country or region?**
- ◆ **These questions are not addressed.**

Customer Considerations

- ◆ What is the cost impact on the generator of waste (residential, ICI and DLC)
- ◆ What is the attractiveness and market for the energy produced
 - Landfill gas products
 - Electricity
 - Steam
- ◆ **Not assessed in the AECOM report or other public documents**

Public Policy Considerations

◆ Compatibility with current and potential future policy on:

– Fiscal considerations

- Is this fiscally sustainable?
- Are there better/competing uses for scarce capital?

– Environmental considerations

- Sustainability
- Climate change
- Maximizing waste diversion

◆ **Not yet addressed**

Economic Development

- ◆ Are there economic development opportunities for the region?
 - New industries
 - New technologies
 - New job opportunities
- ◆ **Not yet addressed**



Conclusions

Conclusions

- ◆ **Based on the current publicly available information, more work is needed:**
 - To undertake detailed financial and risk analyses of the waste disposal options
 - To identify the appropriate evaluation criteria and their relative importance
 - To assess the options against these criteria
 - To provide the public with sufficient information to comment on the proposed options
 - To provide the decision-makers with sufficient information to make an informed decision

Conclusions

- ◆ **Business will ultimately bear more than half of the costs associated with waste management**
 - No assessment of impact on rates
- ◆ **There appears to be time to assess the options fully, as suggested**
- ◆ **The AECOM report is not sufficient to make an informed decision (based on sound business principles) on waste to energy or any other option**



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