

22 May, 2008

RESOURCES FROM WASTE AN INTEGRATED RESOURCE MANAGEMENT APPROACH

AUTHORS' EXECUTIVE SUMMARY

This document provides a summary prepared by the authors of the report "*Resources from Waste - Integrated Resource Management*" [the "IRM Report"] published by the Province of British Columbia on 20th May, 2008.

THE IRM REPORT

The IRM Report was commissioned by the Government of British Columbia to consider new approaches to managing water, solid and liquid wastes in communities across the Province. The focus was to reduce both treatment costs and greenhouse gas emissions.

The Report has been reviewed by experts in municipal infrastructure in British Columbia and internationally. There was universal support for the concept and the need to apply it to demonstration projects across the province.

WHAT IS 'INTEGRATED RESOURCE MANAGEMENT'?

Integrated Resource Management ("IRM") is a fully integrated approach to converting waste into resources. Key principles of this approach include:

- Waste is a valuable resource, not a liability that has to be disposed of at a cost to taxpayers. Solid and liquid wastes contain significant values in terms of biofuels, electricity, heat, water and nutrients. With the price of fossil-based energy increasing rapidly and water becoming scarcer in many parts of the province, water and waste resource recovery is becoming increasingly important.
- Decisions are driven by the business case: How can we maximise the values (i.e., the profit net of cost) from waste, in order to minimise taxpayer impact? Note that not all values are strictly financial, but include values such as greenhouse gas emission reductions, and healthy watercourses.

- IRM uses an integrated design process to managing water and waste such that value is maximised. Resource recovery plants are located near markets for the products; resulting in a system of decentralised plants in order to maximise the resource recovery opportunities.
- IRM uses a "design with nature" approach that reuses all resources as much as possible.
- The goal of IRM is zero waste, with all wastes diverted from landfills and incinerators.

IRM is significantly different from a system designed simply to recover resources from waste treatment. This more traditional approach focuses on treating wastes (usually at more centralised plants), then looks for opportunities for resource recovery. This approach has benefits but does not optimise the resource potential or the values.

BENEFITS OF AN IRM APPROACH

- The Climate Action Charter requires signatories to reduce GHGs by 33% by 2020 and make their operations carbon neutral by 2012. By applying an IRM approach, communities can potentially reduce GHG emissions by 25% — a significant contribution to these targets that requires minimal personal, family, corporate or government adaptation at low or no net cost to the taxpayer.
- Solid and liquid wastes can provide sufficient energy to heat the equivalent of 30% of a typical community's homes, and to provide electricity for 10% of homes. In practice, heat recovery would be more efficiently supplied to large users such as commercial and institutional buildings, hospitals, government buildings, post secondary schools and shopping centres. The 'green electricity' would be uploaded to the grid.
- With the IRM approach, water from sewage treatment can be treated to a sterile (tertiary equivalent) level. This reclaimed water can be used to recharge streams, wetlands and groundwater to improve ecological health of watersheds, or for non-potable uses such as irrigation or toilet flushing.
- IRM can generate biofuels to run the equivalent of 10% of a community's vehicles. This fuel source is carbon neutral, and does not take land away from agricultural productivity.
- IRM takes a 'just-in-time' approach, adding new treatment plants as the population grows. Capacity can be added as and where needed, rather than building excess capacity upfront.
- Taxpayer costs are significantly reduced, as the capital and operating costs are offset by the sale of resources.

IRM IN THE CRD

At the Province's request the IRM model was applied to the core area of the Capital Regional District, including Victoria and surrounding municipalities with a population of approximately

300,000. The Province had already directed the CRD to redesign its liquid waste management plan to provide for secondary level treatment.

The proposed IRM approach to meet CRD needs was to locate up to 32 decentralised treatment plants, most of which could be located within buildings or existing municipal infrastructure. Heat could be recovered for local use by commercial and institutions; biosolids would then be pumped or otherwise diverted to more centralised digesters to generate electrical energy. The organic solid wastes from residences and commercial establishments can be fed to anaerobic digesters to generate other recovered resources, for example to create biofuels for bus transportation with the residuals being used for composting on agricultural lands.

The estimates for this model indicate that this approach could reduce electricity costs required for pumping and waste treatment by 33%. It also has the advantage of being modular and scalable, which enables adaptation and growth of systems as and when needed, taking advantage of improvements in technology over time. This avoids the large expense of constructing large scale treatment facilities in anticipation of probable needs projected to meet population growth over the next 50 years, as with traditional approaches.

NEXT STEPS

- Currently the IRM study is conceptual in nature; it does not provide detailed engineering and financial designs at a level that could be applied directly to a municipal system. It does however set out some of the options open to communities and industry and the metrics and processes required to maximise resources and minimise waste.
- The report calls for a number of pilot or demonstration projects to be undertaken in various parts of the province to test out the approach and refine the costs and benefits. It notes that portions of IRM have been undertaken in parts of BC and that variants have been undertaken internationally. The purpose of the pilots is to assess the application to circumstances in BC and ensure the concept is, as seems likely, applicable in a Canadian context and climate.
- The study recommends that further work be undertaken and that a coordination or "project office" be created to support this change. This is to help municipalities consider how the IRM model can be adapted to meet each community's needs and circumstances.

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