



Eagles sit atop pipes that are used to collect methane gas at the City of Vancouver landfill in Ladner. Vancouver Sun - [NICK PROCAYLO / PNG](#)

Challenge: Should the City of Vancouver pursue sole, joint or third-party ownership of a landfill gas upgrading facility?

The City of Vancouver has owned and operated the 320-hectare Vancouver Landfill in Delta since 1966. The City currently captures just over 75% of the landfill gas generated on site. Of that 75%, approximately 55% is recovered for use in heating and electricity generation at a local greenhouse, and the remaining 45% is flared to meet regulations. The Vancouver Landfill Renewable Natural Gas Project is designed to recover landfill gas, upgrade it then add it to the provincial natural gas distribution system. The ownership structure of the facility determines the proportion of the costs and benefits that arise from the ownership of the facility.

The project has the following objectives:

- To achieve significant reductions in Carbon emissions through recovering landfill gas generated at the landfill;
- Generation of renewable natural gas for use in City vehicles and buildings to offset natural gas use.

Solution: The economists at the TBL-CBA Consulting Services arm of Autocase built risk-adjusted TBL-CBA business cases to assess the three ownership options

The Landfill Renewable Natural Gas Project generates large enough social and environmental benefits to easily overcome the lifecycle financial cost. Differences in the lifecycle financial NPVs across alternatives are driven by the ownership structures of the alternatives.



Social & Environmental impacts can, in this case, be classified into two main categories: greenhouse gas emissions, and criteria air contaminant emissions.



Lifecycle financial impacts are composed of the direct incremental financial impacts resulting from the project over the study period including capital costs, operations & maintenance costs, replacement costs, and residual value, as well as revenues and avoided costs.



Triple Bottom Line Cost Benefit Analysis (TBL-CBA) is a systematic evidence-based economic business case framework that uses best practice Life Cycle Cost Analysis (LCCA) and Cost Benefit Analysis (CBA) techniques to quantify and attribute monetary values to the Triple Bottom Line (TBL) impacts resulting from an investment.

TBL-CBA provides an objective, transparent and defensible economic business case approach to assess the costs and benefits pertaining to the project being analyzed.

Where appropriate, each cost and benefit has a range of potential values. This probabilistic assessment accounts for the inherent risk and uncertainty in the project parameters, using a Monte Carlo simulation – a best practice in economic analysis.

Impact

- Capital Costs
- Operations and Maintenance
- Replacement Costs
- Residual Value of Assets
- Electricity costs for the upgrading facility
- Renewable Natural Gas costs
- Landfill gas sales revenue
- Renewable natural gas sales revenue
- Electricity and Natural Gas Purchases
- Greenhouse Gas Emissions
- Criteria Air Contaminant Emissions

Results: For the City of Vancouver, Triple Bottom Line Cost Benefit Analysis (TBL-CBA) provides an objective, transparent, and defensible business case framework to assess ownership structure for an environmentally beneficial project.

Autocase: Making the business case for infrastructure projects.



Autocase Consulting from Impact Infrastructure, Inc.

A complex project can be both costly and time consuming. Why not have our experienced economists take some of that burden off of you and not only run the analysis for you, but teach you how to do it yourself? Our breadth of service includes: Triple Bottom Line and Cost Benefit Analysis; Financial and Life Cycle Cost Analysis; Economic Impact Analysis; Risk and Cost Risk Analysis; Sustainable Return on Investment; and Cross Asset Strategic Planning – all across a wide range of sectors.

For more information about how TBL-CBA would assist your project, go to www.autocase.com