

## Methane Magic

Famously, you can't make a silk purse out of a sow's ear – but sometimes you can come close. Vancouver's system to use waste to create electricity and heat is a striking example.

Vancouver operates a landfill in Delta, BC. Organic material found in garbage, decomposing without oxygen (anaerobically) generates gas – about half carbon dioxide and half methane. Not only is this gas odorous and flammable (potentially even explosive), but methane is a potent greenhouse gas, trapping heat in the atmosphere 21 times more effectively than carbon dioxide.

In fact, until the City installed an active gas collection system, the landfill represented some five per cent of Vancouver's total greenhouse gas emissions. Since 1991 the collected landfill gas has been collected and 'flared' (burned off). This not only reduces odours and minimizes the risk of fire, but more importantly, converts methane to CO<sub>2</sub>, reducing the climate impact by 95 per cent.

### ONE STEP FURTHER

The City of Vancouver was not satisfied with this, however, because the heat produced by burning the landfill gas was wasted. So beginning in 2003, the landfill gas has been collected and piped to a sophisticated cogeneration facility nearby. There it is burned to provide both electricity and heat. The electricity is sold to BC Hydro, and the heat is used to warm nearby Village Farms greenhouses, which grow vegetables like the tomatoes shown here.

The collection system will be gradually extended as the landfill continues to fill its 225 hectare site over the next 40 years. The amount of landfill gas collected will increase as well, enabling various additional uses under consideration.



A greenhouse that counters the greenhouse effect - Tomatoes flourish in the warmth.



The landfill project in Vancouver is a landmark in environmental efficiency, reducing greenhouse gas emissions by 40,000 tonnes per year—equivalent to eliminating over 7,000 cars permanently from Lower Mainland streets.

### UNSUNG BUT NOT INSIGNIFICANT

This seemingly mundane project is actually the biggest initiative in the Lower Mainland to reduce greenhouse gas emissions. It reduces Vancouver's combined emissions by over five per cent, the equivalent of taking over 7,000 vehicles off the road.

The electricity it generates is enough to power 7,000 homes, and is sold at a premium because it helps BC Hydro meet its targets for sustainable power generation.

### BENEFITS THAT ADD UP

The project reduces Vancouver's greenhouse gas emissions in two ways: by avoiding the landfill's direct emissions, and by displacing emissions that would arise from conventional power and heat generation.

From collection and flaring alone, emissions equivalent to 250,000 tonnes of CO<sub>2</sub> are avoided annually. Power generation and greenhouse heating avoid further emissions from use of fossil fuels at the greenhouse or at a power plant.

### COMMUNITY OUTREACH

Every year, the Vancouver Landfill holds a popular open house that invites the community to see what goes on there. It's a chance for everyone to tour the landfill; learn about its environmental protection systems and energy-generating components; find out about other City sustainability initiatives; pick up free compost; and enjoy fun hands-on activities.

