

Integrated Resource Recovery Case Study:

Regional District of Nanaimo Landfill Gas Recovery and Utilization



Project: Landfill Gas Recovery and Utilization

Location: Nanaimo, British Columbia

Status: Operational since March 2009

Environmental Benefits: Generates enough electricity to supply 1,200 homes while reducing annual greenhouse gas emissions by 21,606 tonnes per year

Business Model: Partnership between the Regional District of Nanaimo (RDN), Cedar Road LFG Inc., and the BC Bioenergy Network with funding from the Federation of Canadian Municipalities (FCM).

Introduction

The Regional District of Nanaimo (RDN) formed a partnership with Cedar Road LFG Inc. and the BC Bioenergy Network (a provincially-funded, industry led network) to construct a landfill gas utilization facility. This facility, which opened in March 2009, produces electricity from methane collected at the regional landfill. It generates revenue for the RDN through the sale of electricity to BC Hydro while reducing greenhouse gas emissions by 21,606 tonnes per year.

Landfill Gas Recovery and Utilization

Landfill gas is produced when microbes digest organic waste in a landfill, and has a global warming effect that is 21 times greater than carbon dioxide. As a result, capturing it significantly reduces the carbon footprint of a landfill. In the past, the gas was captured at the RDN Regional Landfill and flared in order to minimize emissions, control odours and reduce the risk of explosion.

This system recovers landfill gas through a collection field consisting of wells, trenches and network pipes. A centrifugal blower creates a vacuum to extract the landfill gas from the collection field. The gas is piped to the on-site facility where it is fed to two internal combustion engines that power two induction generators. The generators produce electricity that is fed into the BC Hydro grid.

Planning, Finance and Management

In 2000, the RDN received funding from the FCM Green Municipal Fund to conduct a landfill gas utilization study. The research demonstrated a sufficient supply of gas to support a utilization project.

In 2004, the RDN received a further \$585,000 from the FCM to construct a full-scale landfill gas collection system. As part of this agreement, the RDN transferred carbon tax credits acquired from the project to the FCM. The FCM then sold the credits to recover its investment.

Another partner then joined the project - Cedar Road LFG Inc. – which is a subsidiary of Nanaimo-based renewable energy company Suncurrent Industries. The 2006 agreement provided financing and installation of the engines, generators and modular enclosures that house the plant.



The 1.3MW facility became operational in March 2009 and is currently operating at half capacity due to a constricted supply of landfill gas. As part of a larger improvement to the landfill completed in June 2010, the RDN has extended the landfill gas collection field. The upgrade will increase the capture of landfill gas allowing Cedar Road LFG Inc. to increase the supply of electricity it sells to BC Hydro and further reduce emissions.

The landfill gas utilization facility is governed by a public private partnership agreement between the RDN and Cedar Road LFG Inc. The RDN provides the site and the landfill gas, while Cedar Road LFG Inc. provides the required materials, equipment and labour. Cedar Road LFG Inc. pays the RDN 20 per cent of the net profits from electricity sold to BC Hydro .

A Collaborative Development and Demonstration Centre (CDDC) by the BC Bioenergy Network and Cedar Road LFG Inc. is being established for the purpose of showcasing further development of this technology. At the site, operators of small-to-medium size municipal landfills can learn about the collection and utilization technology at a working landfill.

Challenges

Cedar Road LFG Inc. contributed \$3.6 million to the facility. A challenge for the company was securing investment to complete the project as the technology is not yet commonplace. This issue was resolved when the BC Bioenergy Network invested \$400,000, which provided the security needed to enable Cedar Road LFG Inc. to secure a \$1.6 million loan to complete the project.

For more information please contact:

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