New Metro Vancouver incinerator would power 30,000 homes: project manager

Regional government awaiting for guidance from province on technology options

BY BRIAN MORTON, VANCOUVER SUN APRIL 22, 2015 3:57 PM

Sarah Wellman, project manager for Metro's proposed second incinerators, at the existing waste-to-energy plant in Burnaby.
Photograph by: carmine marinellli, Vancouver Sun

VANCOUVER — If Metro Vancouver's proposed second garbage incinerator is ever built, it would do more than get rid of the region's trash. It would also be capable of powering approximately 30,000 homes.

"If you burn garbage, you create heat. In a 'mass burn' facility, the heat is used to create steam, which runs a turbine to produce electricity. That's the essence of a mass burn facility," said the project manager of Metro Vancouver's waste-to-energy project, Sarah Wellman.

She said the proposal is for a plant that would create a third more electricity than the existing Metro incinerator.

The existing plant, Covanta Burnaby Renewable Energy, converts approximately 285,000 tonnes of municipal solid waste annually to 940,000 tonnes of steam. That steam is then used to generate about 170,000 megawatt-hours of electricity for sale to BC Hydro, or enough electricity to power 20,000 homes.

Essentially, the garbage is burned at temperatures of more than 1,000 C. The heat and gases from the process pass into the boiler area, where they heat tubes filled with water. That water boils to become steam; the steam turns the turbo generator to create electricity.

On a typical day, the Burnaby incinerator takes in 800 tonnes of garbage along with lime to control acid gas emissions, ammonia to control nitrogen oxide emissions and phosphoric acid, which is added to stabilize metals in the ash. That translates into 2,750 tonnes of steam to power the turbo generator, 500 megawatt-hours of electricity sold to BC Hydro, 130 tonnes of bottom ash used in roadbuilding and landfill cover, 30 tonnes of fly ash, and 25 tonnes of metal, which is recycled into reinforced steel.

The proposed second incinerator would — if using the same 'mass burn' technology as the Burnaby plant — convert 370,000 tonnes of garbage annually to enough electricity to power about 30,000 homes.

Together, then, the two incinerators could produce enough electricity for 50,000 homes.

However, mass burn technology is one of three on Metro Vancouver's shortlist of technologies to deal with garbage, and Wellman said Metro is waiting to hear from the provincial government on how to proceed.

One of the options is a gasification process that produces a synthetic gas that could be used to provide electricity for 25,000 homes. The gas could also be used to power vehicles such as buses.

A third option is turning garbage into pellets to be burned as a fuel instead of coal at Lehigh Cement in Delta, with the heat generated by burning the garbage used to create the cement. "There's no electricity produced, but it would be a benefit because it would result in no increased air emissions. The others (mass burn and gasification) would have new emissions."

Wellman called the matter "enormously important," adding that waste-to-energy is a far better way to handle garbage than putting it in a landfill. She said they're now working on identifying sites for the new plant.

According to Metro Vancouver, Japan and South Korea have long histories of recovering energy from waste and there is now rapid growth of waste-to-energy facility construction in China. Japan has more than 1,300 waste-to-energy facilities in Japan, and nearly all garbage is processed using a variety of waste-to-energy technologies.

In Europe, over 600 waste-to-energy facilities operate and more are planned.

In Canada, there are eight waste-to-energy facilities including the recently opened Durham York Energy Centre in Ontario that processes 140,000 tonnes of garbage annually, powering 10,000 homes.

In the U.S. there are 88 waste-to-energy facilities, including the Covanta Honolulu Resource Recovery Centre in Hawaii, which meets eight per cent of Oahu's energy needs. The Resources Recovery Facility, a waste-to-energy plant in northwest Miami-Dade County, Florida, processes 1.2 million tons of waste annually, providing enough energy to both operate the plant and supply the electrical needs of 45,000 homes.

Metro Vancouver's plan for a second garbage incinerator has been criticized.

A study last year for waste company Belkorp Environmental Services suggested an incinerator could cost far more than originally estimated. The analysis by ICF International on behalf of Belkorp came as Metro Vancouver attempted to deal with the province's rejection of its proposed Bylaw 280, which was integral to its solid waste management plan because it would have ensured garbage generated in Metro was kept in the region.

Belkorp, which runs the Cache Creek landfill, lobbied against Bylaw 280 and Metro Vancouver's plans to burn the region's waste rather than send it to a landfill. Metro is scheduled to close the Cache Creek dump in 2016.

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Previous **Next**

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