

## Awards

### **Award of Excellence 2011**

Municipal Engineering Category

Consulting Engineers  
of British Columbia

District of Kent  
Duncan-Bateson Pump Station

### **Award of Merit 2011**

Municipal Engineering Category

Consulting Engineers  
of British Columbia

Abbotsford Mission Water &  
Sewer Services  
Dickson Lake Upgrades

### **Award of Excellence 2009**

Municipal Engineering Category

Association of Professional  
Engineers & Geoscientists of  
British Columbia

### **Award of Excellence 2009**

Municipal Engineering Category

Consulting Engineers  
of Canada

District of West Vancouver  
Eagle Lake Membrane  
Water Treatment Facility

### **Award of Excellence 2009**

Municipal Engineering Category

Consulting Engineers  
of British Columbia

### **Gold Award 2009**

Water & Wastewater Category

American Council of Engineering  
Companies of Washington

### **Honor Award Local Civil Engineering Achievement 2009**

American Society of  
Civil Engineers

King County, Washington State  
Design/Build of the  
Brightwater Marine Outfall



## Micro Turbines

To improve environmental conditions, the City of Prince George has installed a Microturbine system to replace their reciprocating engine arrangement at their Lansdowne Wastewater Treatment Centre for the following reasons:

- Lower Carbon Monoxide emissions;
- Better electrical efficiency;
- Uses relatively clean combustion technology
- Improved Power and thermal output; to reduce nitrous oxide emissions;

The design was based on using up to six - 30KW Capstone Microturbines. Four Microturbines are presently in use and there are plans to add another 2 units. The gas is scrubbed using a Siloxane Removal System by Applied Filter Technologies "AFT" . This is a key component to remove impurities from the Digester Gas stream.

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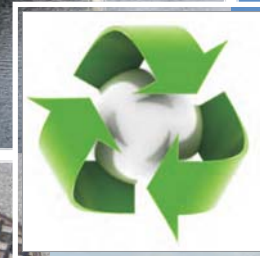
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\*As of 15 Nov 2010 Dayton & Knight Ltd. became Opus DaytonKnight Consultants Ltd.

# Energy Recovery

## Sustainable Municipal Solutions



**OPUS DAYTONKNIGHT**



# Water Wastewater Solid Waste & Biogas Energy Recovery



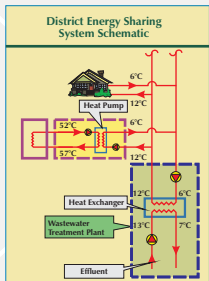
## Heat Recovery

Heat recovered from wastewater effluent is proving to be a reliable source of thermal energy for the Saanich Peninsula District Energy Sharing Systems (DESS). Wastewater heat recovery has gained popularity in North America in the last 10 years, and has been successfully applied in Europe for many years. The design produced by Opus DaytonKnight and DEC Design Mechanical Consultants Ltd. is a low temperature DESS with capacity to serve the following facilities:

- Panorama Recreation Centre pool facility;
- SPWWTP (building heating);
- Centre for Plant Health;
- Kelslet Elementary School;
- Nearby residential areas.

The DESS system will extract heat from final effluent at the SPWWTP and circulate the flow through a two pipe closed loop system.

The range of anticipated energy savings for each facility includes anticipated Greenhouse Gas (GHG) savings. Energy savings are mainly based on the substantial displacement of natural gas consumption. This environmental sustainable system is planned to reduce GHG emissions by over 95% compared to conventional heating technologies.



Opus DaytonKnight is committed to providing long term innovative solutions to clients.

Proven energy recovery options include:

- Heat Recovery in Sewer System;
- Biogas Recovery at Wastewater Treatment Plants & Compositing Facilities;
- Energy Recovery in Water Systems Using Turbines at Reservoirs and PRV Stations.

## Biogas (Methane)

The Annacis Island Wastewater Treatment Plant (AIWWTP) is the largest secondary treatment plant in British Columbia serving in excess of 1,000,000 people. Sludge resulting from the treatment processes is processed in four thermophilic anaerobic digesters which generate biogas. The biogas is used to run the boilers at the plant; surplus biogas is burned in a combined heat and power facility to generate electricity at the plant for export to the grid. The facility is expected to be online in March 2011. When the facility starts feeding the wastes into the digesters, Metro Vancouver will start to see two significant benefits:

- Significant increase in gas production and electrical energy, and other benefits of reduced greenhouse gas emissions;
- Receiving and treating difficult and high strength wastes which would otherwise be very difficult to process using conventional treatment methods.

As a result, one of the Metro Vancouver's goals for managing liquid wastes affordably and effectively will be achieved by recovering energy from liquid waste and biosolids.



## Micro Power Generation

- The District of West Vancouver owns and operates Eagle Lake, a high elevation source of drinking water.
- Water from Eagle Lake is piped 1 km to a service reservoir located about 150 m vertically below it. In 2003, a Pelton wheel turbine was installed at the reservoir to replace a pressure reducing valve.
- The turbine is designed to produce approximately 1.1 gigawatt-hours of electricity per year, about 20% of the power consumed by the District's own operations.
- Energy, formerly lost in the pressure reducing valve, is now harnessed, transformed, and put to beneficial use.
- This facility represents the first application of power-generating technology within a municipal water distribution system in BC.



750mm Diameter Pipe

Service Reservoir and Power House



Turbine

Power to BC Hydro Grid



- The scheme has demonstrated that, under the right conditions, power generation within a drinking water system is not only feasible, but also environmentally and economically sound.

- It is believed that this groundbreaking "green" project could be replicated at many locations within BC.



Reservoir, Internal View

Water to Distribution System

