

## Resource Recovery Examples

Recovery Example	Location	Notes	Contact Info
<b>Biodiesel from sewage</b>	Marlborough, New Zealand	Produces biodiesel from algae grown in the sewage treatment process.	Web: <a href="http://www.nzherald.co.nz/section/story.cfm?c_id=1&amp;objectid=10381404">http://www.nzherald.co.nz/section/story.cfm?c_id=1&amp;objectid=10381404</a>  <a href="http://www.americanenergyindependence.com/biodiesel.html">http://www.americanenergyindependence.com/biodiesel.html</a>
<b>Biodiesel from waste cooking oil</b>	Brentwood Bay	Dr. Don Goodeve is a co-founder of the Island Biodiesel Co-op, a Victoria group which produces biodiesel from waste oil.	Dr. Don Goodeve Brentwood Bay Phone: 544-2060 email: <a href="mailto:don.goodeve@telus.net">don.goodeve@telus.net</a> Web: <a href="http://www.islandbiodiesel.ca/contact/">http://www.islandbiodiesel.ca/contact/</a>
<b>Biosolids to energy</b>	Orange County, California	Sludge is exposed to extreme heat and pressure, rupturing cellular structures. Carbon dioxide gas is split off and water is removed to become "E-fuel," which will be sold to power cement kilns in place of coal.	Web: <a href="http://www.pwmag.com/industry-news.asp?sectionID=760&amp;articleID=547650">http://www.pwmag.com/industry-news.asp?sectionID=760&amp;articleID=547650</a>
<b>Cogeneration of electricity and heat from biofuels</b>	Chetwynd	Uses resource recovery strategies to achieve zero effluent. Sludge is processed into fuel and ash consisting of metal and minerals. The ash is sent to a mine and blended with ore for refining.	Wendy Lyka Environmental Manager Tembec Chetwynd Pulpmill

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<p><b>Cogeneration of electricity and heat from biogas from sewage sludge</b></p> <p><b>Biogas for vehicles from sewage sludge and organic household waste</b></p>	Kristianstad, Sweden	100,000 tons/ year of sewage and solid organic waste are turned into greenhouse gas-neutral fuel, to produce 44GWh/year of energy for buses, trucks, personal cars, taxis, and for cogeneration of heat and electricity for the community.	<p>Mr. Lennart Erfors City of Kristianstad Coordinator, Climate Strategies Phone: 011 46 44 13 61 60 email: <a href="mailto:Lennart.Erfors@kristianstad.se">Lennart.Erfors@kristianstad.se</a> web: <a href="http://www.kristianstad.se/templates/custom/PageInternational_5600.aspx">www.kristianstad.se/templates/custom/PageInternational_5600.aspx</a></p>
<p><b>Cogeneration of electricity and heat from biogas from sewage sludge</b></p>	Metro Vancouver, Annacis Island Lulu Island	<p>Metro Vancouver's Annacis Island plant operates anaerobic digesters which produce biogas. The biogas is burned in generator sets which produce enough electricity to meet roughly 60% of the plant's electrical energy needs.</p> <p>Metro Vancouver moved in October, 2007 to implement MicroSludge technology in the LuLu Island plant. According to Metro Vancouver, <i>"The net result will be to provide the Lulu Island WWTP with 80% to 100% of its electrical requirements and 100% of its heat requirements."</i></p>	<p>Craig Shishido, Annacis Island Phone: 604.436-6888 Web: <a href="http://www.gvrd.bc.ca/sewage/annacis.htm">http://www.gvrd.bc.ca/sewage/annacis.htm</a></p> <p>Related article: <a href="http://www.paradigmenvironmental.com/news/index.php?sbget=article_news,1,55,,0,,29,,;main_news,1,29,,0">http://www.paradigmenvironmental.com/news/index.php?sbget=article_news,1,55,,0,,29,,;main_news,1,29,,0</a></p>
<p><b>District Energy System</b></p>	Revelstoke	This community owns a 1.5 MW district energy system, which burns wood waste from a neighbouring sawmill. Subscribers pay 5% less than they did for propane, and price increases are limited to the rate of general inflation.	<p>David Johnson, President Revelstoke Community Energy Corporation #200-103 2<sup>nd</sup> Street, Revelstoke, BC (250) 814-0113 <a href="mailto:djohnson@rcfc.bc.ca">djohnson@rcfc.bc.ca</a></p>
<p><b>Fuel cells powered by biogas</b></p>	Portland, Oregon	The Columbia Boulevard Wastewater Treatment Facility has installed microturbines and fuel cells to produce electricity from biogas.	<p>Web: <a href="http://www.chpcenternw.org/NwChpDocs/ColumbiaBlvdWastewaterCaseStudyFinal.pdf">http://www.chpcenternw.org/NwChpDocs/ColumbiaBlvdWastewaterCaseStudyFinal.pdf</a></p>

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<b>Fuel cells powered by biogas</b>	Renton, Washington King County, Washington and Portland, Oregon	Demonstration was scheduled for 2004-2006.	Web: <a href="http://dnr.metrokc.gov/wtd/fuelcell/">http://dnr.metrokc.gov/wtd/fuelcell/</a>
<b>Gasifier producing synthesis gas from wood waste</b>	Heffley Creek, BC  Kamloops, BC	Tolko Industries Inc has installed a gasifier built by Nexterra at its Heffley Creek sawmill. The gasifier converts wood waste into synthesis gas which replaces natural gas in the sawmills lumber drying kilns.  Domtar has also installed a Nexterra gasifier, to replace natural gas in the lime kiln at its Kamloops pulpmill.	Darcy Quinn, Nexterra Energy Phone: (604) 637-2501  Web: <a href="http://www.nexterra.ca/">http://www.nexterra.ca/</a>
<b>Gasifier producing synthesis gas from wood waste</b>	Victoria Dockside Green	The Nexterra gasifier is scheduled to be in service in 4Q 2008.	Darcy Quinn, Nexterra Energy Phone: (604) 637-2501 Web: <a href="http://www.nexterra.ca/">http://www.nexterra.ca/</a>
<b>Heat recovery from wastewater</b>	Kelowna, BC	Heat pumps are used by Okanogan College to extract heat energy from the nearby Kelowna Wastewater Treatment Plant.	Leter Csandl Okanogan College Phone: 250-762-5445 local 5625
<b>Heat recovery from wastewater</b>	Whistler Village, Whistler, BC	The Resort Community of Whistler will recover heat from wastewater through passive heat exchangers, and by means of heat pumps installed in each building in the Athletes Village.	Kerr Wood Leidal Associates Ltd and DEC Design John Hart, PEng Phone: 604-294-2088 Email: <a href="mailto:jhart@kwl.ca">jhart@kwl.ca</a> Web: <a href="http://www.kwl.ca">www.kwl.ca</a>

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<b>Heat recovery from wastewater</b>	Southeast False Creek and Olympic Athletes Village, Vancouver	Raw sewage will pass through a heat exchanger, where thermal energy will be captured, resulting in greenhouse gas emissions less than half those of traditional heat options.	Chris Baber NEU Project Manager Phone: 604-871-6127 email: <a href="mailto:chris.baber@vancouver.ca">chris.baber@vancouver.ca</a> Web: <a href="http://vancouver.ca/sustainability/building_neu.htm">http://vancouver.ca/sustainability/building_neu.htm</a>
<b>Heat recovery from wastewater</b>  <b>Biogas in buses</b>	Stockholm, Sweden	Energy which is recovered from the Henriksdal treatment plant's effluent is enough to heat 80,000 homes in the city. Converts kitchen waste in the sewage plant's biogas digesters to produce methane to run the city's buses.	Dr. Marta Tendaj Business Development Manager Stockholm Vatten Phone: 011 46 8 522 120 28 or 011 46 8 522 120 00 email: <a href="mailto:marta.tendaj@stockholmvatten.se">marta.tendaj@stockholmvatten.se</a>
<b>Nutrient recovery</b>	Colton, California	Pyrolysis is used extensively in the US; the Sludge-To-Oil Reactor System (STORS) in Colton converts ammonia in the sludge to fertilizer.	Web: <a href="http://www.thermoenergy.com/munistsors2.htm">http://www.thermoenergy.com/munistsors2.htm</a>

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Nutrient recovery	Gold Bar Plant, Edmonton	Ostara Nutrient Recovery Technologies Inc. of Vancouver has developed a process to recover phosphorous from wastewater treatment. The process is being implemented in the Gold Bar Plant in Edmonton, and is expected to provide a revenue stream in the form of sales of fertilizer. The recovered fertilizer takes the form of inorganic crystals ("Crystal Green™"), which are sold as fertilizer, and the system is expected to pay for itself in three to five years.	<p>Vince Corkery, PEng            City of Edmonton, Gold Bar Wastewater Treatment Plant            email: <a href="mailto:vince.corkery@edmonton.ca">vince.corkery@edmonton.ca</a>            Phone: (780) 496-4323</p> <p>Related articles:  <a href="http://www.bivinteractive.com/index.php?option=com_content&amp;task=view&amp;id=175&amp;Itemid=32">http://www.bivinteractive.com/index.php?option=com_content&amp;task=view&amp;id=175&amp;Itemid=32</a>   <a href="http://www.canada.com/edmontonjournal/news/story.html?id=3080401b-cc04-4c76-b787-3c9d16bb7fb2&amp;k=99624">http://www.canada.com/edmontonjournal/news/story.html?id=3080401b-cc04-4c76-b787-3c9d16bb7fb2&amp;k=99624</a></p> <p>Matt Wilson            Ostara Nutrient Recovery Technologies Inc.            Vancouver, BC            Phone: 604.408.6697            web: <a href="http://www.ostara.com">www.ostara.com</a></p>

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Reclaimed water	Sooke Harbour House, Victoria	<p>Reclaimed water is used to flush toilets and to irrigate certified organic gardens. Past tests have shown it to be comparable to drinking water standards.</p> <p>Plant reduced consumption of potable water by 2.3 million litres of water per year.</p>	<p>Sinclair Philip or Francis Louvat Sooke Harbour House 1528 Whiffen Spit Road Phone: 642-3421</p> <p>Web: <a href="http://www.sookeharbourhouse.com/">http://www.sookeharbourhouse.com/</a></p> <p>Related articles: <a href="http://www.crd.bc.ca/reports/water/2003/ecycle1130/recycle1130.pdf">www.crd.bc.ca/reports/water/2003/ecycle1130/recycle1130.pdf</a></p>
Reclaimed water	Sequim, Washington	<p>100% of Sequim's wastewater is treated to reclaimed water standards. Some of the reclaimed water fills a small manmade lake, and some is used for irrigating parks (Carrie Blake Park). Locals initially opposed his plans for the manmade lake, but now are asking him to expand it.</p>	<p>Jim Bay, Public Works Director Phone: 360-683-4908 ext. 434</p> <p>Web: <a href="http://www.ci.sequim.wa.us/pubworks/sewer.cfm">http://www.ci.sequim.wa.us/pubworks/sewer.cfm</a></p> <p>Related articles: <a href="http://www.djc.com/news/en/11146993.html">http://www.djc.com/news/en/11146993.html</a></p>
Reclaimed water	City of Vernon	<p>The City of Vernon has been using reclaimed water for irrigation for twenty-five years.</p>	<p>Web: <a href="http://www.vernon.ca/services/utilities/reclamation/index.html">http://www.vernon.ca/services/utilities/reclamation/index.html</a></p>
Reclaimed water	Gold Bar Plant, Edmonton	<p>Edmonton's Gold Bar wastewater treatment plant provides more than a million litres per day of reclaimed water to the nearby Petro-Canada Refinery.</p>	<p>Vince Corkery, PEng email: <a href="mailto:vince.corkery@edmonton.ca">vince.corkery@edmonton.ca</a> Phone: (780) 496-4323</p>