

Title	Proponent	Project Type	Location	Stage	Funders	Private Sector	Budget	Economic Benefits	Environmental Benefits	Weblinks
Vancouver/Lower Mainland										
Bakerview EcoDairy Anaerobic Digester	Bakerview EcoDairy	Anaerobic Digestion. A mixed plug flow digester converts manure from 55 cows into organic fertilizer, animal bedding, and biogas. Biogas from the digester runs a 15 kW generator. The digester design is small-scale, modular, above-grade, and uses fibreglass tubes rather than concrete tanks.	Abbotsford	In operation	Bakerview EcoDairy Ltd., Avatar Energy Ltd., BC BioEnergy Network (\$240,000), BC Hydro Power Smart Technology Demonstration Fund (\$80,000), and the Environment Farm Plan (\$70,000).	Digester Design: Avatar Energy Ltd.	\$600,000	Reduced cost of electricity for the farm.	Reduced odours and ammonia emissions from manure storage, improved nutrient management, generation of local electricity, and greenhouse gas emission reductions of 165 tonnes per year.	Read More
Geoexchange Heat Recovery from Water Filtration Plant Clearwell	Metro Vancouver	This geoexchange system incorporates 45 one-km loops installed in the mud layer beneath the clearwell to heat and cool space, and to heat domestic hot water at the Seymour-Capilano Filtration Plant.	District of North Vancouver	In operation	Metro Vancouver, BC Hydro Power Smart and the Canadian geoexchange Coalition.	Mechanical consultant: Stantec. Geoexchange system consultant: SSBV Consultants	\$380,000	Payback of 4.8 years after electricity consumption and demand savings, greenhouse gas credits, and maintenance costs are taken into consideration.	Greenhouse gas emission reductions of 385 tonnes per year.	
River District Energy System	Parklane Homes	This district energy system will receive heat from the Burnaby Waste Incinerator.	City of Vancouver	Under construction as of March, 2013					Greenhouse gas reductions by avoiding fossil fuel and electricity consumption which would otherwise be used to provide heat.	Read More
Lulu Island Wastewater Treatment Plant (WWTP)	Metro Vancouver; National Research Council	WWTP anaerobic digestion upgrades. Biogas is burned to heat buildings and digesters. Dewatered biosolids are used primarily for reclamation at former mine-sites.	Lulu Island	In operation	Gas Tax-2.4million, ICE Fund \$3 million	Paradigm Environmental Technologies	\$12 million	Reduced ongoing operating costs by more than \$500,000 per year. Reduced Capital Costs by eliminating purchase of \$14 million of additional anaerobic digesters and dewatering equipment.	Reduction of 43% of the Lulu Island WWTP's emissions. Reduced trucking of biosolids.	Read More
The Annacis Island Centre for Excellence: Annacis Island Wastewater Treatment Plant (WWTP)	Metro Vancouver, UBC	Thermophilic anaerobic digestion feeding a 3.2 MW cogeneration system. In addition to optimizing treatment operations at the plant, the Centre will provide laboratory facilities for research, training and equipment demonstrations, and will allow treatment processes to be piloted on-site, giving partners the opportunity to develop innovative responses to the challenges of sustainability and integrated resource recovery.	Annacis Island	Announced Jan 2010		\$4million from Federal Infrastructure Stimulus Fund, provincial contribution is a part of a three year, \$14 billion capital infrastructure program. (other \$3million to come from UBC and Metro Van)	\$9 million upgrade.	Reduced energy costs; reduced wear and tear on boilers. 60% of electricity needs met by cogen.	80% of the WWTP's energy needs are met with biogas. Upgrade will include energy and water saving systems, natural lighting, and advanced recycling and waste collection.	Read More

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Southeast False Creek Neighbourhood Energy Utility (NEU)	City of Vancouver	The SEFC Neighbourhood Energy System recovers waste heat from wastewater, and provides space heating and domestic hot water to 16,000 residents in the community. The rooftops of many buildings capture rainwater for use in toilet flushing and irrigation, reducing potable water use by approximately 50%.	Vancouver	In operation	FCM Loan \$5 million, \$8.5 million grant from the Union of BC Municipalities' Innovations Fund, \$16.0 million in debenture financing,		\$29 million	Eliminates need for boilers in individual buildings. The operation will contribute \$500,000 per year in salaries. The first phase will inject \$29 million into the economy. The City of Vancouver expects 5-6% Return on Investment over 25 years.	Heat from wastewater will supply 70% of neighbourhood's annual thermal needs. Expected to lead to a reduction of at least 70% of the greenhouse gas emissions associate with heating the connected buildings.	Read More
Burns Bog Landfill Gas Collection	City of Vancouver; Maxim Power Corporation	Cogeneration based on landfill gas at nearby greenhouse. Project generates 5.55 MW of electricity for sale to B.C. Hydro and 100,000 GJ/year of heat for sale to the CanAgro greenhouse.	Delta	In operation since 2003	Green Municipal Fund provided a multi-million dollar loan as part of the financing scheme.	Maxim Power Corporation, CanAgro	Total cost of the project (approximately \$10 million) invested by Maxim Power Corp.	The City of Vancouver will receive revenues of approximately \$400,000 per year for the duration of the 20-year contract. Delta expects to receive between \$80,000-\$110,000 per year in municipal tax revenue. Low cost heat also supports the protection of 300 greenhouse jobs.	The project results in the recovery of approximately 500,000 GJ/year of energy, and results greenhouse gas reductions of more than 230,000 tonnes per year. CanGro's use of fossil fuels I also reduced by 20%.	Read More
Whistler Athlete's Village District Energy Sharing System (WAVDESS)	Whistler 2020 Development Corporation	District Heating from wastewater provides 90% of heating and up to 75% of hot water heating for the Olympic Village. Cogeneration based on landfill gas currently being explored. Project will be run as a municipal utility.	Whistler	In operation		DEC Design; Kerr Wood Leidal	\$4 million capital cost, operations and financing approximately \$200,000/year.	Energy at \$14/gigajoule (including capital cost financing, system maintenance, etc.) Actual revenue to municipality dependent on rates as set by council decision.	70% reduction compared to Business As Usual.	Read More
Catalyst Power Anaerobic Digester	Catalyst Power	On-farm anaerobic digestion at a dairy farm to create biogas from 350 tonnes of manure per day. The biogas is upgraded to pipeline-quality biomethane using water-scrubbing technology. Water is recycled, and carbon dioxide from the upgrading process is used to increase growth at an on-site greenhouse and algae facility.	Abbotsford	In operation	ICE Fund \$1.5 million	Catalyst Power; PlanET Biogas Solutions; Greenlane	\$4.5 million-\$5.5 million	Revenue from biomethane sales and increased plant growth.	Biogas produced would provide enough energy for 1,000 homes. Other benefits include reduced odours from manure storage, improved nutrient management, and greenhouse gas emission reductions.	Read More
Port Mann Landfill Gas Capture	Norseman Engineering	Landfill gas used to fuel dryers in wallboard manufacturing plant.	Surrey	In operation since 1993		Norseman Engineering; Georgia-Pacific purchases the gas			Greenhouse gas reductions of 40,000 tonnes per year.	Read More

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Jackman Landfill Gas Capture	Norseman Engineering; Township of Langley	Landfill gas heats commercial greenhouses and provides carbon dioxide to enhance plant-growth.	Aldergrove	In operation since 1995		Norseman Engineering; Topgro Greenhouses Ltd.	Cost shared between Norseman and Topgro	Reduced heating costs, and plants grow faster in a carbon dioxide enriched environment.	Greenhouse gas reductions of 18,000 tonnes per year.	Read More
SunSelect Produce - Wood Waste to Energy	SunSelect Produce	Wood waste from a local sawmill is used in biomass boilers to heat 70 acres of greenhouses.	Aldergrove and Delta	In operation	ICE Fund \$2.24 million		\$6.69 million	\$4.3 million per year savings to the greenhouse industry. Commercialization of the technology will help create jobs. Carbon offsets are sold.	Clean energy from this renewable fuel source is 20% more efficient than existing wood waste plants. Greenhouse gas emission reductions of 22,000 tonnes per year.	Read More
Direct-Fired Boiler Biomass Gasification Demonstration Project	Nexterra, FP Innovations and Kruger Products	Direct-fired biomass gasification system to reduce natural gas consumption at the Kruger tissue mill. The boiler can accommodate a wide range of wood wastes.	New Westminster	In operation	ICE Fund \$1.5 million, Natural Resources Canada, Ethanol BC	Nexterra; FP Innovations; Kruger Products	\$9 million	Will generate \$1.25 million of labour, 540,000 man hours of BC labour, and save \$2.8 million/year of net energy at the mill.	Greenhouse gas emission reductions of 22,000 tonnes per year.	Read More
Wastewater Recovery at Vancouver Convention Centre (VCC)	BC Pavilion Corporation (PavCo) - a Provincial Crown Corporation	On-site wastewater treatment provides reclaimed water for toilet flushing and irrigation of a green roof. The Centre also imports and treats wastewater from Metro Vancouver's system.	Vancouver	In operation since 2009	Project funded by Infrastructure Canada's Western Economic Diversification program	Project Management by Stantec Consulting	Entire project (Convention Centre and all related infrastructure) \$883.2 million.	Decreased cost of purchased water.	Reduced consumption of freshwater.	Read More
The Village - District Energy at Fraser Mills	FortisBC; The Beedie Group	Local industrial waste heat will be integrated with geoexchange and natural gas.	Coquitlam	In development as of 2013			\$25 Million		The district energy system will reduce the demand on the province's electricity grid, and could displace up to 8,200 tonnes of greenhouse gas emissions a year.	Read More
Geoexchange District Energy Utility for Upper Gibsons	Town of Gibsons	Community Energy System using geoexchange as the primary heat source.	Gibsons	In development as of 2013	\$244,080 from Island Coastal Economic Trust (ICET)		Approximately \$1 million	Energy cost savings of \$350,000 annually; about 1/3 of which will be returned to residents as energy cost savings.	Expected to reduce greenhouse gas emissions from heating by over 90% (1,450 tonnes of greenhouse gases per year).	Read More

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Richmond Oval Waste-Heat and Water Re-use	City of Richmond	The facility uses the roof for rainwater capture, and the water is re-used for toilet flushing and irrigation. The building has the potential for heat recovery from the ice refrigeration plant: recovered energy could be used for space heating and domestic hot water. The potential for use in a district heating system is also being explored.	Richmond, BC	In operation				Potential for reduced heating costs.	Reduced consumption of freshwater.	Read More
Hillcrest/Nat Bailey Stadium Park Venue - Integrated Heat Recovery Solution	City of Vancouver	Waste heat will be captured from the curling rink refrigeration plant to heat the adjacent aquatics centre. This will include the pool water and pre-heating of domestic water; the majority of the energy will be applied to space heating.	Vancouver, BC	Completed in 2009	VANOC, and federal and provincial funding.				Reduced greenhouse gas emissions from conventional sources of energy.	Read More
Whistler Sliding Centre - Integrated Heat Recovery Solution	Vancouver Olympic Committee (VANOC); post-games ownership will revert to Whistler Legacies Society	The Sliding Centre, a seasonal operation, will use about 20% of the heat captured from its refrigeration plant to heat the plant building and a guest services building. Because of the Sliding Centre's relative isolation, there is no immediate use for the rest of the recaptured heat. In the future, as Whistler implements its Sustainable Energy Strategy, this heat source could be connected to a district heating and cooling system.	Whistler	In operation since 2009	VANOC, and federal and provincial funding.				Emissions from building heating avoided.	Read More
UBC Living Laboratory: Integrated Water and Energy Project	University of British Columbia	On-site wastewater treatment is planned for a population of 55,000. Facility will likely reclaim water, nutrients, and energy from wastewater. The project may make UBC the first net-positive water and energy campus in Canada.	Vancouver	Completion by 2014					Potential to reduce heating emissions, reduce need for fertilizer, and to reduce the energy used to transport and treat wastewater.	Read More
UniverCity at Simon Fraser University	SFU, SFU Trust, Corix	Biomass-based district energy system.	Burnaby	Expected completion date of 2014		Corix			Expected to reduce greenhouse gas emissions by 1,750 tonnes per year.	Read More

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Biofuel Facility	City of Surrey	The planned facility will accept 80,000 metric tonnes per year of food and yard wastes from residential and commercial sources, and produce a renewable natural gas for sale, and for use in the City's garbage collection trucks.	Surrey	RFP to be issued in 2013	Federal Government: up to \$16.9 million through P3 Canada fund.			Production of low-cost fuel for the City's waste collection fleet. This facility will lead to regional economic benefits because it is likely that surrounding jurisdictions will deliver their organic waste to this site.	The proposed facility will process 80,000 metric tonnes of waste per year and will help Surrey and Metro Vancouver achieve the regional 70% waste diversion target by 2015.	Read More
Alexandra District Energy Utility	City of Richmond; Oris Geo Energy Ltd.	City-owned utility will provide energy for space heating, space cooling, and domestic hot water in serviced buildings in Richmond's West Cambie neighbourhood.	Richmond, BC	First phase in development	City of Richmond	Oris Geo Energy Ltd.	The first phase of the utility is expected to cost \$3 million, and will cost \$80,000 to operate annually at full capacity.	The utility is expected to generate \$360,000 annually in revenues for the City.	The first phase of the project will combine a district heating system with ground source heat pump technology enabling the Alexandra District Energy Utility to deliver efficient heating to West cambia with reduced greenhouse gas emissions.	Read More
Surrey Downtown Centre	City of Surrey	The City of Surrey plans to develop, and encourage the development of, district energy. The City has passed a bylaw to foster the development of district energy, and design of the first systems is underway.	Surrey, BC	This project was in the planning stages as of March, 2013						Read More
Vancouver Island & Gulf Islands										
CVRD Integrated Anaerobic Digestion Facility	Comox Valley Regional District	Anaerobic Digestion. A 2012 feasibility study identified the opportunity to co-locate digestion of biosolids and organic waste in an integrated facility, to produce biomethane for use in transit buses and for sale.	Courtenay, BC	Feasibility Study completed in 2012	BC Ministry of Community Sport and Cultural Development: \$10,000 Infrastructure Planning Grant			Potential for revenues and savings to the community of an estimated \$2 million per year. Potential for lower lifecycle costs of solid waste management and liquid waste management. Avoided capital expenditures and deferred capital expenditures. Local sustainable employment.	Potential for greenhouse gas reductions of 25,000 tonnes per year. Diversion of 26,000 tonnes/year of organic waste from landfills. Production of 20,000 tonnes/year of fertilizer.	Read More

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Parksville Geoexchange Municipal District Heating Utility Study	City of Parksville	The pre-feasibility study investigated the potential for establishing a municipal energy utility in two new developments planned in Parksville.	City of Parksville	Study completed in 2011	\$7,500 Provincial Infrastructure Planning Grant Program			Increase the efficiency of heat delivery; eliminate need for boilers in individual buildings, while providing a potential revenue stream to the city.	Reduce carbon intensity and energy intensity of heat delivery.	Read More
French Creek Pollution Control Centre Anaerobic Digestion Feasibility Study	Nanaimo Regional District	The project evaluated the benefits and costs of using anaerobic digesters at the French Creek Pollution Control Centre to produce biogas for heating and other energy needs.	Nanaimo Regional District	Study complete	\$10,000 Provincial Infrastructure Planning Grant Program			More efficient use of existing infrastructure, with some opportunity to reduce operating costs.	Potential to reduce consumption of electricity from BC Hydro and natural gas.	Read More
Joint Tri-Regional Waste-to-Energy Viability Study	Nanaimo Regional District	The study compared the costs of a centrally located waste-to-energy facility which would serve the three southern Vancouver Island regional districts with current disposal costs in the three regions, and also analyzed greenhouse gas impacts.	The Cowichan Valley Regional District, the Regional District of Nanaimo and the Capital Regional District (CRD).	Study completed in 2012	\$10,000 Provincial Infrastructure Planning Grant Program				Potential to divert waste from landfills.	Read More
Village Centre Wastewater Treatment Facility Water Reuse and Heat Recovery Feasibility Study	Township of Esquimalt	Feasibility study for water reuse and heat recovery from effluent from a proposed wastewater treatment plant in the municipal facilities in Village Centre.	Township of Esquimalt	Study in progress as of March, 2013	\$10,000 Provincial Infrastructure Planning Grant Program				Potential to reduce greenhouse gas emissions, and to reduce demand on freshwater sources.	Read More
Community Energy System at Docksider Green	Nexterra and Corix	Biomass gasification facility will burn local wood waste to produce space heating and domestic hot water for every building in the development.	Victoria	Completed for the Docksider residential and commercial buildings	\$2.2 million from Natural Resources Canada, and \$350,000 from the Green Municipal Fund	FortisBC, Windmill Development Group Ltd., Vancity Capital Corporation and Corix Utilities Inc.		Plans exist to also sell heat to buildings outside of the development.	Combined energy efficiency measures could result in greenhouse gas reductions of 5,200 tonnes per year.	Read More
Wastewater Treatment Plant (WWTP) at Docksider Green	Windmill Developments	All wastewater is treated on-site, and over 30 million gallons of water are reused per year. Reclaimed water is used for irrigation, toilet flushing, and other non-potable applications.	Victoria	In operation since 2009				In total, approximately \$80,000 per year in water purchases will be saved through water-reuse. Residents are also exempt from local government wastewater treatment costs.	Potable water usage greatly decreased. Reclaimed water creates wildlife habitat and amenity on the Docksider site.	Read More
Hartland Landfill Gas Utilization Project	Capital Regional District	Landfill gas is collected, treated and burned to generate 1.6 MW of electricity.	Saanich	In operation since 2004	CRD funded 70%, Maxim Power 30%	Maxim Power	\$2.7 million, not including the gas capture system that was already in place.	CRD receives royalties between \$250,000 and \$2 million over the 20-year project life, depending on the amount of electricity produced and its market value.	The CRD estimates that 32% of generated landfill gases from the Hartland Landfill are captured.	Read More

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Saanich Peninsula Thermal Energy Recovery System	Capital Regional District	District heating from wastewater will heat nearby buildings.	Saanich	In operation since 2012	Gas Tax-2.98 million		\$3.652 million	The system is expected to provide a 15 year payback.	38% reduction in greenhouse gas emissions from heating	Read More
Greater Nanaimo Pollution Control Centre	Regional District of Nanaimo	Biogas from the anaerobic digesters is now burned in a 335 kW generator to produce electricity and heat for the facility.	Nanaimo, BC	In operation	\$350,000 from FCM's Green Municipal Fund and \$2.3 million from Union of BC Municipalities Gas Tax Program		\$2.95million	The generators will provide all of the heat and most of the electricity required for the facility.	Before this upgrade, 60% of biogas from the anaerobic digesters was flared. Biogas will now be burned to generate 335 kW of electricity.	Read More
Westhills Wastewater Treatment Plant		LEED neighbourhood design project will include an integrated utility with on-site wastewater treatment, energy production, and water recovery connected to compulsory district heating system.	Langford, BC	In planning						Read More
Beausoleil Solar Aquatics Water Reclamation System	Errington, BC	Solar aquatics (flora and fauna) used to treat wastewater in a small BC community of 46 homes.	Errington, BC	In operation since June 1996		ECO-TEK Wastewater	\$200,000 capital cost; \$14,000 annual O&M costs	The system was the least expensive option for this community.	The system replaced failing septic fields, and consumes less energy and fewer chemicals to treat wastewater.	Read More
Skyrocket - Compost from Biosolids	Comox Valley Regional District	Biosolids from the Comox Valley Water Pollution Control Centre (CVWPCC) are trucked to a composting facility and composted with wood waste. The resulting compost (Skyrocket) is sold as fertilizer.	Cumberland, BC	Skyrocket has been available since 2005 (The treatment plant has composted biosolids since 1982)				Compost is sold for \$10-16 per cubic yard.	Nutrients in biosolids are returned to soil. The environmental impacts of artificial fertilizer production are reduced.	Read More
Cedar Road Landfill-Gas-to-Electricity Facility	Regional District of Nanaimo	This modular 1.4 MW plant generates electricity from captured landfill gas.	Nanaimo, BC	Phase One completed May 2009	\$400,000 investment from BC Bioenergy Network	BC Bioenergy Network, Cedar Road Landfill Gas Inc.	\$3million	Electricity is sold to BC Hydro.	Meets the BC Ministry of Environment's expectation that landfill gas collection and utilization plants be in place by 2016.	Read More
Nanaimo Composting	Regional District of Nanaimo	Food waste is collected through a municipal program for composting. 70% diversion of food waste away from landfills is expected.	Nanaimo, BC		\$2.5 million from the Innovative Clean Energy Funding and \$1.5 million from BC BioEnergy	International Compost Corporation			Diversion of waste from landfills, and reduced methane emissions from landfills.	Read More

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Okanagan/Southern Interior										
Waste Heat to Electricity	Pristine Power Inc. and ENMAX Green Power Inc.	Electricity from Waste Heat. Waste heat installations in Savona and 150 Mile House recover waste heat from natural gas compressors, to generate 5 MW of electricity from each facility.	Savona and 150 Mile House	In operation since 2008	Pristine Power Inc. and ENMAX Green Power Inc.				Based on both plants producing 10 MW of electricity, the proponents estimate greenhouse gas emission reductions of 25,000 tonnes per year.	Read More
Enderby Biomass District Energy	Enderby's Fink Machine biomass system	District Energy, Biomass. This 540 kW system burns waste wood and pellets to heat eleven buildings.	Enderby	In operation since 2011		Fink Machine		Energy expenditures remain in the community. Cost savings and price certainty for energy system clients.	Greenhouse gas emission reductions of 425 tonnes per year.	Read More
Kelowna City Centre Energy System and Kelowna South Padosy Energy System	City of Kelowna, FortisBC	The district energy systems will use waste heat from the City's wastewater treatment plant, and also and from Sun-Rype Products Ltd..	Kelowna	Announced in 2010			\$22-million (City Centre) and \$16-million (South Padosy)		Greenhouse gas emission reductions of the two projects could reach 16,300 tonnes per year.	Read More
Silverton Integrated Large-Scale geexchange System Feasibility Study	Village of Silverton	This feasibility study will investigate the use of a large-scale geexchange system to supply heating, cooling, and hot water to homes in Silverton via a district energy system. Since the village is located on the shores of Slokan Lake, it is ideally suited for the use of a water source geexchange heat pump system as a municipal energy utility.	Village of Silverton	Study completed in 2012	\$10,000 Provincial Infrastructure Planning Grant Program			Increase the efficiency of heat delivery; eliminate need for boilers in individual buildings, while providing a potential revenue stream to the village.	Reduce greenhouse gas emissions from fossil fuels.	Read More
Midway District Energy Opportunity Assessment	Village of Midway	The project will assess the potential for a distinct energy system based on waste heat recovery, geexchange, solar thermal, and biomass to reduce Midway's reliance on fossil fuels, reduce greenhouse gas emissions, and lower operating costs.	Village of Midway	Study in progress	\$5,000 Provincial Infrastructure Planning Grant Program			Increase the efficiency of heat delivery; eliminate need for boilers in individual buildings.	Potential greenhouse gas emission reductions.	Read More
Okanagan College District Heating from wastewater	Okanagan College	The campus is heated with a district energy system, which recovers heat from treated wastewater from the adjacent Kelowna Wastewater Treatment Plant. This was the first wastewater heat recovery project in Canada.	Kelowna	In operation since 2003	Natural Resources Canada's Energy Innovators Initiative; Aquila Networks Canada	N/A	\$1.5 million	Annual savings of \$100,000 (15 year cost recovery).	Estimated greenhouse gas emission reductions of 8,000 tonnes per year, which includes the effects of building retrofits.	Read More

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Nutrient Recovery at Kelowna Wastewater Treatment Facility	City of Kelowna	Biosolids are thickened, dewatered, and trucked to a composting site where they are mixed with wood waste and composted to create Grade A soil conditioner called Ogogrow.	Kelowna	In operation					Nutrients in biosolids are returned to soil. The environmental impacts of artificial fertilizer production are reduced.	Read More
Penticton Wastewater Treatment Plant Upgrade	City of Penticton	Currently, reclaimed wastewater is used for irrigation, and biosolids are composted and used as fertilizer for landscaping and agriculture. This upgrade will digest biosolids to produce biogas for cogeneration.	Penticton	Construction began in the spring of 2009	Reserves, Borrowing, DCCs, and \$10.6 million from Gas Tax	Earth Tech	\$30 million	Operating costs will be recovered through fees.	Burning biogas in place of natural gas will offset 95.3 tonnes of greenhouse gas emissions. 4.2 tonnes will be offset from generating electricity with biogas and micro turbines. More efficient effluent filtration and energy efficiency from improved aeration will reduce greenhouse gas emissions by 1.5 and 4.1 tonnes respectively.	Read More
Kamloops Wastewater Treatment Plant Upgrade	City of Kamloops	Upgrade of the existing wastewater treatment plant to provide tertiary treatment, as well as nutrient management.	Kamloops	Expected completion date of 2014	\$14 million from the Federal and Provincial governments		\$43.4 million	Upgrade estimated to create 1,750 direct and indirect jobs.	Greenhouse gas emissions reduced through methane capture; reuse of reclaimed water will offset potable water consumption; use of composted biosolids offsets demand for artificial fertilizers; nutrient removal helps protect river quality.	Read More
Biomass Gasification System	Tolko, Nexterra	A gasifier produces synthesis gas from wood residuals to reduce the consumption of natural gas in this veneer mill.	Heffley Creek, near Kamloops	In operation since 2006	Natural Resources Canada, Ethanol BC, Technology Early Action Measures (TEAM)	Nexterra		Savings of \$1.5 million per year in fuel costs.	Reduction of 12,000 tonnes of greenhouse gas emissions annually and reduction of VOCs.	Read More
Halfway Ranch Micro-Hydro Generating Plant	Halfway Ranch	This system takes advantage of pressure in an irrigation system to generate electricity.	Halfway Ranch, west of Kamloops	Announced July 2008	ICE Fund \$40,000		\$200,000	Revenues from sales of green electricity.	Greenhouse gas reductions.	Read More

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Community Energy System	City of Revelstoke	This community energy system receives heat from a biomass boiler which burns wood residuals, located the Downie Sawmill.	Revelstoke	In operation since 2005	FCM Green Municipal Fund grant of \$1,348,000 loan of \$1,348,000; \$1,250,000 from RCFC Holding Company; Loan of \$1,000,000 from the Revelstoke Credit Union. \$1,000,000 from the City of Revelstoke as preferred shares (interest rate 7%).	Downie Timber; FVB Energy	\$5.6 Million	Ten-year payback; 6.7 percent return on investment; 14.8 percent return on equity; Source of non-tax revenues for the City.	Reduction of 45,000 GJ per year of propane consumption. Reduction of 4,000 tonnes per year in greenhouse gas emissions. Replacement of a local beehive burner with a cleaner system.	Read More
Landfill Gas Capture at Salmon Arm landfill	FortisBC; Columbia Shuswap Regional District (CSRD)	Capture of landfill gas at a section of the landfill.	Salmon Arm, BC	In operation		Terasen	Estimated \$2 million for facility.	Potentially \$25,000/year in revenue accruing to regional government.	Reduction of greenhouse gas emissions in the form of methane from the landfill, as 26,000 GJ per year of methane is captured.	Read More
Wastewater Recovery and Reuse	City of Vernon	Treated wastewater is used for irrigation, and biosolids are composted for sale.	Vernon, BC	In operation for over 20 years				Reduced capital costs, potential for deferred capital cost of fresh water infrastructure, revenue from fertilizer.	Reduced consumption of freshwater, as reclaimed water irrigates 970 hectares of land, including golf courses, an orchard, a tree nursery, and lands for cattle grazing and hay production (Reference: Polis, 2012). Reduced consumption of artificial fertilizers; reduced energy use in water treatment and transport.	Read More
Micro-hydro in Existing Water Infrastructure	District of Lake Country	This 1.1 MW micro-hydro project takes advantage of hydraulic pressure in the existing water supply system. The turbine recovers energy which would otherwise be wasted through Pressure Reduction Valves.	District of Lake Country	In operation since June 2009	\$2.8 Million Gas Tax and ecoENERGY for Renewable Power; \$500,000 low-interest loans from Federal government, and \$30,000 from Green Municipal Fund	Canyon Power	\$3.3 million	3,900 megawatt-hours of electricity per year will be provided. \$200,000 in electricity sales to BC Hydro provided.	Electricity for 400 homes provided within existing waterworks infrastructure.	Read More
Nakusp and Area Community Complex/Arena	Village of Nakusp	Heat recovery from ice-making, possible geoexchange loop, and heat storage to be used in showers and Zamboni fill. Heat pump systems may also be used for ice making and heating/cooling of building.	Nakusp	Under construction	\$400,000 Towns for Tomorrow Grant	Delterra Engineering				Read More

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Nakusp Energy Cabin	Nakusp Energy Corporation (NEC), Arrow Lakes School District 10	Uses wood waste (pellets, pucks and chips) and solar technology. It is connected to the Nakusp High School's (100,000 square feet) heating system, replacing the existing propane fuelled system. The fuel storage bin can hold 30 tonnes of fuel.	Nakusp	In operation	Received a Grant from Natural Resource Canada which covered the down payment. Financing from European Union (through Austrian company Energy Cabin)	NEC, Energy Cabin	\$180,000 for the system.	School will save 30% on its heating bill - in first year burnt 15 tonnes of pellets @ \$120 CDN per ton (vs. Using 96,000 litres of liquid propane @ .40 cents a year - an annual cost of \$38,000)	Opportunity to use local wood waste. Meets the province's air emissions standards.	Read More
Study of Bio-energy from Agricultural and Wood-Waste in Merritt	City of Merritt; Lower Nicola Indian Band	Study to investigate viability of producing wood pellets from forest and agricultural residue, municipal waste, and mountain pine beetle fibre.	Merritt, BC		\$105,000 - Western Economic Diversification Canada, through the Community Economic Diversification Initiative (CEDI) a component of federal Mountain Pine Beetle Program.		\$105,000 (study)			Read More
Northern BC										
Village of Telkwa Biomass District Energy	Village of Telkwa	District Energy, Biomass. The Village of Telkwa will install a biomass heating system which will burn waste wood from forests around the community. The new system will provide heat to the municipal building, a nearby business, a school and four residences.	Village of Telkwa	Funding announced	Federal Government: \$680,230 through the Gas Tax Fund			Energy expenditures remain in the community	Greenhouse gas reductions of 10 tonnes per year.	Read More
Reclaimed Water Plant (RWP)	City of Dawson Creek; Shell	The RWP will treat effluent which is currently released into Dawson Creek to a standard suitable for industrial and municipal uses. Potential uses for reclaimed water include oil and gas production, dust control on roads and the irrigation of sports fields.	City of Dawson Creek	In development	Shell and City of Dawson Creek	Shell	\$11.25 million	The sale of the City's portion of reclaimed water could result in revenues of more than \$1 million per year. Without this RWP, the City could be facing a substantial investment in future sewer infrastructure.	The use of reclaimed water will end the consumption of the City's potable water for industrial purposes and will significantly reduce the amount of fresh water drawn from the Kiskatinaw watershed.	Read More

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UNBC Gasification System	University of Northern British Columbia	This biomass gasification facility will produce heat for university buildings.	Prince George (UNBC Campus)	In operation	ICE Fund \$3.5 million. (Federal government and provincial government covering construction fees)	Nexterra	\$15 million	Estimated savings of \$60,000 to \$80,000 per year by reducing fossil fuel consumption by 80,000 GJ per year. Job creation (17,000 person hours of labour). The project is also part of larger plan to establish UNBC as a bioenergy centre, which may bring other direct and indirect economic benefits.	Will displace 85% of Natural Gas use, and will reduce the university's carbon footprint by approximately 3,500 tonnes per year.	Read More
Enviro-Carbonizer	Altern Energy	Conversion of approximately 180,000 tonnes of waste per year into "biocarbon" (charcoal). Feedstock includes forest waste, mountain pine beetle infested biomass, and eventually may incorporate municipal waste and scrap tires. Biocarbon can be used for energy, water purification, steel processing and agriculture.	Prince George	Announced July 2008	ICE Fund \$3 million	Altern Energy	\$8.16 million			Read More
BCR Bio-Energy Project	P.G. Interior Waste to Energy Group	This plant will use a chemical decomposition process to convert wood waste into electricity, charcoal, and bio-oil. The plant will produce 8 MW of electricity from approximately 100,000 cubic metres of waste wood per year that would otherwise be burned or landfilled.	BCR Industrial Site, Prince George	Contract signed with BC hydro		P.G. Interior Waste to Energy Ltd.	\$50 Million	Approximately 50 to 75 construction jobs & creation of 70 permanent jobs to operate the facility.	Potential to reduce greenhouse gas emissions by displacing fossil fuels with bio-oil; generation of sustainable electricity.	Read More
Baldy Hughes Therapeutic Community (BHTC)	New Hope Society	District Energy System. A new 750 kW district energy system, with heat provided by wood pellet boilers replaced the pre-1930's vintage propane boilers. The system provides heat to eight of the community's twenty-two buildings.	Prince George	In operation since 2009	ICE Fund, Northern Development Trust, BC New Hope Society. Del-Tech Manufacturing Inc. installed the system at no cost to BHTC. Pellet start-up contribution from Pacific Bioenergy.	Del-Tech Manufacturing Inc., New Hope Society	\$460,000	Reduction in energy costs of 30-50%	Greenhouse gas emission reductions of 190 tonnes /year.	Read More
Sam Lindsay Aquatic Centre/ Tamitik Arena	City of Kitimat	Waste Heat from ice plants used to heat the water in the Aquatic Centre- both pool water and potable water.	Kitimat	In operation since 2009	30,000 grant from the Community Halls and Recreations Funding program					Read More

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City of Prince George	City of Prince George	This district energy system will receive heat from sawmill biomass boiler located near the downtown area.	Prince George	In operation since 2012	Green Municipal Enabling Funding from FCM				Reduction of particulate emissions of approximately 100 tonnes per year. Greenhouse gas emission reductions of 1,800 tonnes /year.	Read More
Kitwanga Lumber Company	Pacific BioEnergy Corporation	Bioenergy (wood pellets) using waste from local mill.	Kitwanga					50 new jobs.		Read More
Canadian Examples (Outside BC)										
Pelee Hydroponics Anaerobic Digester	Pelee Hydroponics	Anaerobic Digestion. This facility processes 40,000 tonnes per year of greenhouse plant waste and manure from local farms to produce biogas. The biogas is burned in two 1.6 MW generators: the electricity is sold to the Ontario Power Authority, and heat replaces fossil fuels in the operation's greenhouses.	Leamington, Ontario	In operation since 2011	Federal Government: \$1.6 million loan	Seacliff Energy, Agrinz	\$6.5 million	Expected revenues of \$2 million per year. Creation of 3-4 jobs.	Production of clean energy, production of local fertilizer, greenhouse gas reductions of 10,400 tonnes per year.	Read More
Georgian Bluffs Biogas Cogeneration Project	Georgian Bluffs and Chatsworth	Anaerobic Digestion. This facility digests septage and other organic waste, and produces biogas for a 100 kW generator. The project was a cooperative venture between the communities of Georgian Bluffs and Chatsworth, Ontario.	Owen Sound, Ontario	In operation since 2011	Federal Government and the Province of Ontario jointly: \$1.7 million grant		\$3.72 million	Reduced solid waste management costs, revenues from generated electricity.	Diversion of solid waste from landfills, reduced methane emissions from landfills, generation of clean energy, production of compost (digestate)	Read More
Toronto Zoo Biogas Project	ZooShare Biogas Co-operative	Anaerobic Digestion. This facility will digest manure from the zoo, along with food waste from local grocery stores to produce fertilizer and biogas. The biogas will be burned in a 500 kW cogeneration plant to produce heat and electricity.	Toronto	Developing funding	Ontario Power Authority Community Energy Partnerships: \$0.2 million	Public shareholders through Community Bonds	\$5.4 million (estimated)	Demonstration of the sustainability of community-financed green infrastructure.	Production of fertilizer, diversion of waste from landfills, and estimated greenhouse gas reductions of 12,000 tonnes per year	Read More
City of Yellowknife Biomass District Energy	City of Yellowknife	District Energy. A wood pellet boiler provides heat to the Community Arena, Curling Rink and Pool facilities through a 750 kW district heating system.	City of Yellowknife	In operation since 2011			\$540,000	Annual savings of \$139,000 by replacing 296,000 litres per year of heating oil	Greenhouse gas reductions of 79 tonnes per year	Read More

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Cite Verte Biomass District Energy	La Cite Verté	Four 1.25 MW pellet fuel boilers provide heat through a 2 km district energy system to 840 apartments and 7000 m2 of office and commercial space pm a 9.3 ha development. The system temperatures are relatively low, with supply temperatures of at 90°C and return of 50°C. The system incorporates six weeks of fuel storage on site.	Quebec City	In operation since October, 2011	Support from Hydro Quebec, the Province of Quebec, and a \$4.7-million grant from Natural Resources Canada's Clean Energy Fund				Reduced greenhouse gas emissions.	Read More
Toronto Deep Lake Cooling	Enwave Energy	District Energy. This cooling system draws water from Lake Ontario, to provide cooling to buildings in downtown Toronto. With a capacity of 59,000 tons of cooling (207 MW), the system can cool 3,200,000 square metres of building space.	Toronto	In operation	City of Toronto, Enwave Energy	Enwave Energy	\$200 million	Price certainty for cooling.	Reduction in energy consumption for cooling of 90%, or 85 million kWh per year. Reduction in water consumption for cooling towers of 4,400 cubic metres per year. Greenhouse gas reductions of 732 tonnes per year.	Read More
Lachenaie Landfill Gas Capture		Landfill gas is burned in a 3.7 MW generator.	Lachenaie, QC	Electricity generated since 1996				Ongoing revenue to BFI from sale of electricity to Hydro Quebec.	Greenhouse gas reduction equivalent to 250,000 tonnes of CO2.	Read More
Disinfection at North End Water Pollution Control Centre	City of Winnipeg	Heating and cooling from wastewater via heat pumps.	Winnipeg	Fully In operation		Earth Tech	\$600,000 for HVAC	Annual energy savings \$20,000.	Greenhouse gas emissions are reduced.	Read More
Edmonton MSW-to-Energy Facility	Enerkem Greenfield Alberta Biofuels (EGAB); City of Edmonton	Biofuels (ethanol) and green chemicals from municipal solid waste.	Edmonton	Under construction as of March, 2013	The City of Edmonton and the Province of Alberta, through the Alberta Energy Research Institute (AERI), are contributing a combined CDN\$20 million	Greenfield Ethanol and Enerkem are partnered for this project.	\$70 million	36 million litres (9.5 million gallons) of ethanol produced; Payback in approximately 10 years, depending on the cost of gasoline.	The ethanol will reduce Alberta's carbon footprint by more than 6 million tons over the next 25 years. It will enable the City of Edmonton to increase its residential waste diversion rate to 90%.	Read More
Complexe Environnemental de Saint-Michel Landfill Gas Capture	City of Montreal	A 23 MW generator burns captured landfill gas produces electricity which is sold to Hydro-Quebec.	Montreal	In 1989 began flaring methane gas, in 1996 began generating electricity		SNC-Lavalin; Biothermica; Gazmont		Enough electricity to power 15,000 homes; Montreal receives over \$1 million per year in royalties from gas sales.	Greenhouse gas reductions as methane in landfill gases is captured and burned.	Read More

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Anaerobic Digestion	City of Toronto	An assessment of the energy potential of anaerobically digested Source Separated Organic (SSO) material. Following bench and pilot scale testing, process optimization scale up information will be used for wide application of anaerobic digester systems in the City of Toronto.	Toronto	Completed in 2006	City of Toronto, Environment Canada (EC), NRCan/OERD - Technology and Innovation Research and Development (T&I R&D) Initiative, and University of Waterloo				Significant reductions of greenhouse gas emissions are anticipated by this research through the capture of methane and the production of renewable energy.	Read More
Keele Valley Landfill Gas Capture	City of Toronto	One of the world's largest landfill gas generation systems, at 33MW.	Vaughan, Ontario	In operation since 1995				Sale of energy nets over \$1.5 million per year in royalties for the City.	Greenhouse gas reductions as methane in landfill gases is captured and burned.	Read More
Clover Bar Landfill Gas Capture	City of Edmonton, EPCOR	Landfill gas is collected, cleaned and supplied to the Clover Bar Generating Station, where it is burned with natural gas to generate 5 MW of electricity.	Edmonton	Began operation in 1992		Environmental Technologies Inc.		Provides enough electricity to supply 4,000 homes; the City of Edmonton receives royalty payments for collection of a resource that would otherwise be a liability.	Greenhouse gas reductions as methane in landfill gases is captured and burned.	Read More
Water Reuse	City of Edmonton	Reclaimed water is sold to a nearby refinery, where it is used to produce hydrogen for low-sulphur fuels.	Edmonton	Completed in 2006	Petro-Canada	Zenon Environmental				Read More
Energy Management Control System	City of Saint John	Installation of a energy management control system that remotely monitors energy use in individual buildings	Saint John, NB	Completed in 2008	FCM's Green Municipal Fund	Province of NB, Irving Oil, Natural Resources Canada, Enbridge Gas NB		Cost savings of more than \$5 million.	Reduction of energy consumption by approximately 17% from 1996-2007.	Read More
Niagara Waste Systems Ltd. Landfill Gas Capture	City of Niagara Falls	Filtered and dried landfill gas is sold to the nearby Abitibi-Consolidated Newsprint Recycling Plant in Thorold, via a dedicated 3km pipeline owned and maintained by Enbridge.	Niagara Falls, ON	Began operation in 2002, expanded capacity in 2003 and 2007		Integrated Gas Recovery Services Inc.		Produces approximately 35% of the heat required for newsprint operations at a the paper mill; reduces fuel costs for the newsprint company.	Greenhouse gas reductions as methane in landfill gases is captured and burned.	Read More
Britannia Landfill Gas Capture	Region of Peel	Produces 5.5 MW of electricity, enough to power the nearby village of Streetsville, Ontario.	Mississauga, ON	In operation		Integrated Gas Recovery Services Inc.		Region of Peel receives emissions credits from the project	Greenhouse gas emissions reductions of 250,000 tonnes annually	Read More

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Landfill Gas Capture	St. Catharines	Produces 275 kW of electricity, powering the nearby Shaver hospital.	St. Catharines, ON	In operation		Glenridge Gas Utilization Inc		Potential to sell greenhouse gas emission credits; revenues from electricity sales.	Greenhouse gas reductions as methane in landfill gases is captured and burned.	Read More
Trail Road Landfill Gas Capture	City of Ottawa	This 5 MW facility sells electricity to the Ontario Power Authority.	Ottawa, ON	Began operation in 2007		Integrated Gas Recovery Services Inc. and Energy Ottawa Inc.		The City of Ottawa receives royalties from gas rights, capital contribution to the LFG collection system expansion/upgrades, and annual operation and maintenance savings relating to gas field collection system.	Reduces greenhouse gas emissions by up to 180,000 tonnes per year relative to 1990 levels	Read More
Eastview Landfill Gas Capture	Ecotricity Guelph Inc.	Landfill gas to energy, generates 2.5 MW.	Guelph, ON	Began commercial operation in August 2005, expanded capacity in 2006				Contractor sells electricity to the Ontario Power Authority	Greenhouse gas reductions as methane in landfill gases is captured and burned.	Read More
Bensford Road Landfill Gas Capture	City of Peterborough	Peterborough Utilities Inc. presently undertaking assessment of the potential	Peterborough, ON	Expected to be complete in 2013	Ontario government will fund up to two-thirds of the project cost				Greenhouse gas reductions as methane in landfill gases is captured and burned.	Read More
Ravensview Wastewater Treatment Plant	Utilities Kingston	A new cogeneration facility which will use biogas from thermophilic anaerobic digestion of biosolids to produce 370 kW of electricity, as well as heat.	Kingston, ON	Commissioned March 2009	\$25M (1/3) Federal - Canadian Strategic Infrastructure Fund, 1/3 province, 1/3 normal sewerage fees	Prime Contractor: Pomerleau Ontario Inc.	\$100 million		Reduced greenhouse gas emissions.	Read More
Cogeneration Wastewater Upgrade	City of Regina	Cogeneration retrofit. Currently a small amount of methane used for boilers, most is flared. Substantial economic and environmental savings projected from cogeneration upgrade.	Regina, SK	In planning as of March, 2013	Green Municipal Fund	N/A	Study: \$125,000	Added: savings to boiler maintenance due to hydrogen sulphide in gas	Greenhouse gas emission reductions of 3,700 tonnes per year	Read More

Title	Proponent	Project Type	Location	Stage	Funders	Private Sector	Budget	Economic Benefits	Environmental Benefits	Weblinks
Pinehedge & Terryland Farms	Pinehedge Farms and Terryland Farms	Anaerobic Digestion of manure. Biogas is used for cogeneration, with some electricity sold. Heat is used for on-farm buildings and yogurt production. Pinehedge Farms has 50 cows and a 100 kW generator, while Terryland Farms has 135 cows and a 180kW generator.	Prescott-Russell County, ON	In operation since August 2007	292,500 from Ontario Rural Economic Development Fund		Approximately \$900,000	12-15 cents/kWh from net metering program in Ontario	Other benefits include reduced odours from manure storage, improved nutrient management, generation of local electricity, greenhouse gas emission reductions.	Read More
Klaesis Power Project - Frepro Farms	Frepro Farms	On-farm anaerobic digestion of manure and combustion of biogas for electricity. Manure collected from 300 animals (140 dairy cows). Electricity used on-farm and heat used for running the digester.	Foresters Falls, ON	In operation since 2003	\$50,000 innovation award from the Ontario government	Organic Resource Management Inc (ORMI) provides much of the feedstock. Tipping fee paid but reduced based on quality of feedstock.	\$250,000 (much of the work done by proponents)	40 per cent is used to power the farm, cutting a monthly power bill that was once \$2,500 to only a basic \$30 fee. The remaining 60 per cent is sold to Ontario's power grid at an average of 12 cents per kilowatt hour, about \$120 a month.	Reduced odours from manure storage, improved nutrient management, generation of local electricity, greenhouse gas emission reductions.	Read More
Stanton Dairy Farm	Stanton Dairy Farm	Anaerobic Digestion of manure, producing 1.3 MW of electricity. The farm was designed as a research and development facility in a joint venture with the Universities of Guelph, Waterloo and Western Ontario for research projects on bioenergy, biogas technologies, testing of organic matter and gas production.	Ilderton, ON	In operation			\$4.5 million	Revenues from sales of green electricity	Reduced odours from manure storage, improved nutrient management, generation of local electricity, greenhouse gas emission reductions.	Read More
Growing Power Hairy Hill	Highmark Renewables, Alberta Research Council (ARC)	Wheat is grown for cattle feed, and starch is removed from the wheat for ethanol production. The cattle manure is anaerobically digested to produce biogas, which is burned to generate electricity. Heat from cogeneration is used to assist digestion, and remaining nutrients used for fertilizer.	Hairy Hill, Near Town of Two Hills and Town of Vegreville, Alberta	In operation	\$ 4 million provincial funding.		\$100 million.	Revenue from 75,000 tonnes of greenhouse gas credits at \$15 in Alberta.	Greenhouse gas emission reductions of 75,000 tonnes per year. Other benefits include reduced odours from manure storage, improved nutrient management, generation of local electricity, greenhouse gas emission reductions.	Read More

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Ledgecroft Farms Inc. Anaerobic Digester	Ledgecroft	470 animal dairy farm with 500 kW anaerobic digester. Electricity is sold to Ontario Power Authority under the Standard Offer program. Organic Resource Management Inc (ORMI) will deliver 5,000 cubic meters/year of organic residuals to farm.	Seeley's Bay, Ont. (north of Kingston)	In operation	\$50,000 grant from National Research Council of Canada.			Receiving fees from Organic Resource Management Inc. Revenues from sales of electricity.	Reduced odours from manure storage, improved nutrient management, generation of local electricity, greenhouse gas emission reductions.	Read More
Bayview Flowers Anaerobic Digestion Project	Bayview Flowers	Anaerobic digestion of several waste streams (off-grade dog food, culled potatoes, grape pomace, dairy manure and cracked corn). Biogas is used for cogeneration, providing all lighting and heating needs for the greenhouse, with excess electricity sold.	Jordan Station, Ontario	In operation since 2007	OMAFRA - provincial funding - 40% eligible costs up to \$400,000	PlanET Biogas Solutions		5-10 year payback. The pet food manufacturer will save \$30,000 per year in waste disposal costs. Bayview Flowers have been able to take the greenhouse of the City's grid.	Improved nutrient management, generation of local electricity, greenhouse gas emission reductions.	Read More
District Energy at Whistle Bend	City of Whitehorse	During the design phase for Whistle Bend, a feasibility study for a district energy system was completed. Options assessed by the study included solar, geo-thermal, and sewer heat recovery.	Whitehorse, Yukon	Study completed	Study funded through Federation of Canadian Municipalities Green Municipal Fund			Calculations based on 50 year return on investment. Combination of sewer heat recovery, geoechange, and solar projected an return of 6.7%.	Potential greenhouse gas emission reductions.	Read More
Brazeau Country Solar Aquatics	Brazeau County, Alberta	Brazeau County is replacing an aging sewage lagoon in Cynthia with a Solar Aquatics system, which uses flora and fauna to recover water, heat, and nutrients from wastewater. Building designed to operate in cold climate and uses heat recovery, and solar hot water.	Cynthia, Alberta	In operation since June, 2009	Brazeau County, Federation of Canadian Municipalities, Alberta Government		\$1.3 million capital costs; \$14,000 O&M costs. (Less expensive than projected cost of a wastewater lagoon type system).	Future plans include selling reclaimed water to the oil and gas industry, and accepting biosolids and wastewater from portable washrooms. If implemented, revenue (water sales + tipping fees) will likely pay off investment within 10 years.	Reduced potable water use. Nutrients available for reuse as compost.	Read More
Quebec City Waste Transformation Plant	Quebec City	Will convert organic matter into biofuel. Program will also offer curb side pick up for 70 percent of residential homes and businesses	Quebec City	Construction expected to be completed by 2013	\$17.7 by federal government, \$16.5 million by provincial government			Could theoretically be used to power 150 buses.	Provides additional uses for organic waste, diverting this waste from the landfill, and will help reduce greenhouse gases.	Read More
Watson Lake Cogeneration and District Heating	Watson Lake Council	District heating using heat recovery from electricity generation. Heat recovery equipment retrofitted onto existing generators, enough to heat several large buildings and the town swimming pool.	Watson Lake, Yukon	In operation since 1999			\$750,000	Approximately \$75,000 in revenue annually. Cost recovery within 10 years.		Read More

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US Examples										
District Energy St. Paul	District Energy St. Paul	This district energy system heats more than 190 buildings and 300 single-family homes (31.8 million square feet), and cools more than 100 buildings (18.8 million square feet) in downtown Saint Paul. Heat for the system is provided by a cogeneration facility (65 MW thermal) and a solar installation (1.3 MW thermal).	Saint Paul, MN	In operation since 1983				Local sustainable employment, energy revenues remain in the community.	Reduced greenhouse gas emissions of 80,000 tonnes per year versus coal.	Read More
Point Loma Wastewater Micro-Hydro	City of San Diego	Treated effluent from the Point Loma wastewater treatment plant descends approximately 27 metres from the plant to an ocean outfall. The flow drives a 1.35 MW micro-hydro turbine to generate electricity.	San Diego	In operation since 2011	California Energy Commission, State of California	Henwood Energy Services, Inc	\$1.2 million	Value of green electricity,	Greenhouse gas reductions related to electricity generation.	Read More
Seattle Steam Co. Biogas Boiler	Steam Plant at Western Avenue	Recovered wood waste provides 60% of the fuel for the steam boiler, heating area buildings; natural gas provides the remaining 40%.	Seattle, WA	In operation since 2009	Seattle Steam Co.		\$25 million	Cost stabilization and money spent locally for fuel	The company reduced its carbon footprint by reducing greenhouse gas emissions by about 45,000 tonnes annually.	Read More
West Point Wastewater Treatment Plant	King County, Washington	Biogas is used to run four internal combustion engines, which run the main pumps for incoming wastewater; the exhaust heat provides heat for workspaces and the digesters.	Seattle, WA	Began operation in 1985				Reduced electricity costs for the plant.	Potential for greenhouse gas reductions.	Read More
South Wastewater Treatment Plant	King County, Washington	Biogas is burned in a fuel cell to generate electricity, and in gas turbines to generate heat and electricity.	Renton, WA	Fuel cell in demonstration from 2004 to 2006, with plans to resume operation in 2008; separate turbines in operation since 2005				Some biogas is sold to Puget Sound Energy, and it displaces the cost of other fossil fuels	Biogas displaces the use of other fossil fuels	Read More

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King County Cedar Hills Regional Landfill	King County, Puget Sound Energy	This landfill gas to energy project will be the third largest in the US, powering 24,000 homes.	Maple Valley, WA, 20 miles southeast of Seattle	In operation		Bio-Energy Washington, a subsidiary of Interco			Greenhouse gas reductions as methane in landfill gases is captured and burned.	Read More
Biosolids to Energy	Five Los Angeles-area sanitation districts	Biosolids are processed under high pressure and temperature, to produce a fuel with an energy content comparable to coal. This fuel is being used to displace coal at a nearby cement kiln.	Orange County, CA	In operation since mid-2008	Private equity funds	Genentech Environmental	\$78 million	Reduction in costs compared to traditional methods of drying biosolids	Reduction of greenhouse gas emissions from coal combustion.	Read More
East Bay Municipal Utility District Resource Recovery Program	East Bay Municipality Utility District (EBMUD)	Anaerobic Digestion. Biosolids from wastewater treatment and community food waste are digested separately, to generate heat and electricity through three 2.1 MW generators. The facility plans to expand in 2013.	San Francisco	Anaerobic digestion of food waste in operation since 2008				90% of on-site power needs are met through the use of biogas. After expansion, plan to sell excess power to Pacific Gas and Electric. Generation of tipping fees and electricity that helps to keep wastewater rates low while providing environmental benefits.	Diverts Food waste from Landfill- preventing methane release into the atmosphere. Reduced emissions from trucking locally to EBMUD.	Read More
Landfill Gas (methane) for Garbage Trucks	Altamont Landfill in California	Landfill gas is purified and used to power municipal garbage trucks.	Livermore, California	In operation					Reduction of methane emissions from landfills.	Read More
International (Outside North America)										
Liquefied Biogas Buses	Upplands Local (Bus company)	Fuel Replacement. Since 2002, all transit buses in Linköping have run on biomethane. In 2012, two hundred buses were re-fitted to burn Liquefied Biomethane (LB), which is the first application of LB in Sweden.	Linköping, Sweden	In operation				20% to 30% improvement in fuel economy.	Greenhouse gas emission reductions of 16,000 tonnes per year, for 200 buses	Read More
Sandvika District Heating and Cooling System	Viken Fjernvarme	Treated wastewater provides approximately 50% of the energy for this district heating and cooling system. The system has a heating capacity of 13 MW (47 GWh/year), a cooling capacity of 9 MW (11 GWh/year), and serves 9,000 residential units.	Oslo, Norway	In operation		Viken Fjernvarme	\$13.95 million		Greenhouse gas emission reductions of approximately 16,000 tonnes per year.	Read More

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Sunamachi Water Reclamation Centre	Local government	Biosolids carbonization facility. 300 tons/day of biosolids are dried and carbonized in a furnace, producing 8,700 tons of biomass fuel. Fuel is used in a power plant with coal. 9% of Tokyo's biosolids is used in this way.	Koto Ward, Tokyo, Japan	In operation since 2007					Total greenhouse gas emission reductions of 46,200 tonnes/year. (Carbonizing biosolids instead of combusting offsets 37,000 tonnes, while offsetting coal reduces emissions by a further 9,200 tons.)	Read More
Mikasagawa Wastewater Purification Centre	Local government	Production of biosolids-derived fuel (BDF) in a wastewater treatment plant. BDF is produced by mixing wastewater biosolids with oil, then heating and drying the output.	Hakata, Japan (island of Kyushu)	In operation since 2000					1,200 tons of BDF can offset 1,100 tons of coal, which will result in a greenhouse gas emission reduction of 2,600 tons per year.	Read More
Morigasaki Water Reclamation Centre	Local government	Thermophilic digestion of biosolids is used to produce biogas to generate electricity. Micro-hydro is also used to generate electricity from effluent outflow.	Tokyo, Japan	AD In operation since April 2004; hydro in operation since June 2005				The biogas produces half of total power used in facility. Results in US\$5.7 million in reduced electricity costs. The hydro generation produces 800,000 kWh per year, or 0.7 percent of the electricity consumed by the plant.	Biogas: 4,800 tonnes of greenhouse gases per year. Hydro-electricity: 300 tonnes of greenhouse gases per year.	Read More
Selby Renewable Energy Park	Whites Renewable Energy	Two new anaerobic digesters will be built inside a former citric acid plant. Feedstock from supermarkets, food processors, caterers, homes, etc. This will be largest facility of its kind in the UK.	Selby, UK	In the final planning stages		Grantham-based Whites Renewable Energy	\$35.5 million	Enough electricity for 10,800 homes.	Greenhouse gas reductions of 28,000 tonnes/year. 165,000 tonnes of kitchen scraps will be available as compost.	Read More
Academica Data Centre- Heat Recovery	Academica Oy Data Centre Helsinki Energia	Waste heat from data centre is the source for a district energy system.	Helsinki, Finland	In operation				Produces enough energy to heat 500 homes. Projected \$561,000 reduction in power bills per year for Academica. Cooling power is 5 times cheaper than traditional cooling methods. Will use about half the energy of regular data centre.	Potential greenhouse gas emission reductions.	Read More