

IEA Task 37 – Energy from Biogas and Landfill gas Country Report – Canada, September, 2011

1) Any new policy/program announcements in the biogas area

Current Canadian Policy – Federal and Provincial

Government of Canada Launches New Clean Energy Innovation Initiative

Natural Resources Canada – August 2, 2011

NRC launched the Government of Canada's new ecoENERGY Innovation Initiative, a \$97 M program that will invest in research, development and demonstration projects for clean energy technologies in five key areas including bioenergy, clean electricity and renewables. The initiative has two separate funding streams: one for R&D projects and one for demonstration projects. ([More...](#))

ecoEnergy for Biofuels

Natural Resources Canada (NRCCanada)

The ecoEnergy for Biofuels program supports the production of renewable alternatives to gasoline and diesel and encourages the development of a competitive domestic industry for renewable fuels. The initiative provides operating incentives to producers of renewable alternatives to gasoline and diesel based on production levels and market conditions. It makes investment in production facilities more attractive by partially offsetting the risk associated with fluctuating feedstock and fuel prices. Financial incentives are provided for the number of litres produced in Canada and sold, based on fixed declining incentive rates established by the program and as agreed upon in each Contribution Agreement. ([Web site](#)).

ecoAgriculture Biofuels Capital Initiative (ecoABC)

Agriculture and Agri- Food Canada

The ecoABC is a \$200 million federal program that provides repayable contributions for the construction or expansion of transportation biofuel production facilities. Eligible applicants include corporations, individuals and partnerships using agricultural feedstock to produce biofuel. ecoABC can provide a repayable contribution towards an individual project of up to \$25 million or 25 per cent of eligible project costs, whichever is less. ([Web site](#))

Provincial and Federal Funding Programs for Bioenergy Projects (Biomass for Combustion Energy, Biogas and Biofuels) - July 2011

OMAFRA (Ontario Ministry of Agriculture, Food and Rural Affairs)

Listing of several funding programs found on their [web site](#).

Sustainable Development Technology Canada (SDTC)

NextGen Biofuels Fund™

Sustainable Development Technology Canada (SDTC) is issuing its Annual Call for Applications under the NextGen Biofuels Fund™, which was created by the Government of Canada to support the establishment of first-of-kind large demonstration-scale facilities for the production of next-generation renewable fuels and co-products.

The NextGen Biofuels Fund™ supports up to 40 per cent of eligible project costs. The contribution is repayable based on free cash flow over a period of 10 years after project completion.

The fund is open for applications all year-round. To be eligible, a project must:

- be a First-of-Kind facility that primarily produces a next-generation renewable fuel at large demonstration-scale;
- be located in Canada;
- use feedstocks that are or could be representative of Canadian biomass;
- have demonstrated its technology at pre-commercial scale.

Next-generation biofuels are derived from non-traditional, non-food renewable feedstocks, such as municipal waste, agricultural and forest residues, and perennial crops on marginal land, and are produced through the use of novel conversion technologies.

(From TheBioenergySite News Desk)

Canada ecoTrust for Clean Air and Climate Change and The Government of Alberta

The Government of Alberta is to grant C\$17.5 million in funding to Millar Western's pulp mill in Whitecourt for project aimed at generating clean energy from waste.

The grant, allocated from Alberta's ecoTrust programme, will help fund the installation of innovative technology to convert organic material from pulp-mill effluent into a biogas that will generate power and heat, displacing fossil fuels in mill processes.

The Bioenergy Effluent Project is expected to deliver significant environmental benefits, including lower greenhouse gas emissions, reduced water consumption, improvements in the quality of treated effluent discharges to receiving waters, and cuts in the production of solid organic waste.

Provincial funding for the project comes from Alberta's share of the Canada ecoTrust for Clean Air and Climate Change.

Provincial Government Support for Biogas

Ontario

Ontario Power Authority – May 26, 2011

Third round of mid-sized renewable energy contracts offered

The OPA has begun offering contracts to 839 CAE FIT projects, of which nine are Biogas projects, representing more than 140 MW of capacity. Contracts will be offered over the next 10 weeks.

These contract offers are the third phase of mid-sized (capacity allocation exempt) renewable energy projects and are for applications submitted between June 5 and December 7, 2010. [More information is available.](#)

(Taken from the Agrienergy Producers' Association of Ontario news letter).

Standard Offer Program - Renewable Energy Standard Offer Program

The Standard Offer Program helps Ontario meet its renewable energy supply targets by providing small electricity generators a standard pricing regime and a streamlined process. As of October 1, 2009 RESOP has been replaced by the Feed-in Tariff Program (FIT Program).

Clean Energy Standard Offer Program

The Clean Energy Standard Offer Program (CESOP) will support small clean energy generators. The Program is intended to encourage participation by a variety of clean energy technologies, including natural gas-fired Combined Heat & Power (CHP), by-product fuel-fired generation projects, and generation projects fuelled by under-utilized energy (thermal or mechanical) sources.

Ontario Biogas Systems Financial Assistance (OBSFA) Program

In 2007 the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) launched the \$12.4-million Ontario Biogas Systems Financial Assistance (OBSFA) Program to provide assistance to farmers and rural businesses to conduct feasibility studies for the installation of biogas systems as well as cover a portion of construction costs for biogas plants.

Feed-in-Tariff (FIT) Program

On September 30th, 2009 the OPA launched the Feed-in-Tariff (FIT) Program offering guaranteed pricing for renewable electricity production. The FIT pricing for on-farm electricity production, includes: 19.5¢/kWh for a plant size ≤ 100 kW, 18.5¢/kWh for a plant size > 100kW ≤ 250 kW and 16¢/kWh for a plant size ≤ 500 kW (OPA, 2009).

Community Power Fund

The Community Power Fund is interested in supporting community biogas projects. Applicants must be members of OSEA. Information on criteria and means of being a member is available at their [web site](#).

2) Estimated Biogas Production in Canada

Taken from BBI Biofuels presentation (Bradley A Saville (University of Toronto) and Brian Duff (BBI International) report/presentation co-authors):

“We note that Ontario contains about 40% of the total Canadian biogas potential - about 320 megawatts. Alberta and BC also have significant contributions to this total at just under 100 megawatts of anaerobic digestion potential in those jurisdictions. Quebec is also notable at about 70 megawatts and then we have smaller amounts distributed across the other provinces. Total Solids from quality Food waste streams and recycled organics a total estimated biogas potential in Canada potential is now over 1500 megawatts and again Ontario represents the largest fraction of this at a little over 800 megawatts. Alberta and British Columbia also have significant contributions to the biogas potential at more than 150 megawatts each and Quebec has over 100 megawatts of biogas potential. “

“Looking at biogas potential from manure, we looked at the livestock profiles within each province and then assumed manure recovery ratios for each of the different types of animals. We considered a 70% recovery for dairy cattle 50% recovery for beef cattle and 80% from hogs. The higher recovery for the dairy cattle and hogs is consistent with the fact that they spend more time within barns and the manure is more easily recovered. The biogas yield is 360 m3 per tonne of volatile solids converted and the manure is assumed to have an average volatile solids content of 3.3%. On this basis the total biogas potential is just under 126 billion m3 within Canada on an annual basis. A large portion of this is based in Alberta with over 43 million m3.”

“In conclusion we have established that there is significant **potential** for biogas in Canada. 125 million m3 of biogas from manure, 0.9 to 2 billion m3 from food and organic waste and a lot of that food and organic waste potential is within Ontario.”

3) Present AD Activities in Canada

There are currently 17 farm digesters operating in Canada, with 7 in Ontario (Desjardins, 2009) and 5 in Alberta alone. With the implementation of the OBSFA program and the new Feed-in Tariff pricing, 14

new biogas plants have been approved for construction on Ontario farms in the next 2 to 3 years (OMAFRA, 2009a).

Approximately 20 biogas projects are in various stages of development in Alberta. It is estimated that by 2012 there will be approximately 25 farm digesters operating in Ontario (Duke, 2009), all of which will be involved in co-digestion.

An example of a current project funded through the [Clean Energy Fund Renewable Energy and Clean Energy Systems Demonstration Projects](#) would be:

Food and Yard Waste Anaerobic Digestion to Electricity Demonstration

Lead proponent: Harvest Power Canada Ltd.

Location: Fraser Richmond Soil and Fibre, British Columbia

Purpose: This project would be Canada's first high-efficiency system for producing up to 1 MW of renewable energy from food and yard waste. If successful, this technology has the potential to be rapidly deployed across Canada as a mechanism to divert food wastes from landfills and produce renewable energy.

StormFisher Biogas

Cambridge, Ontario

A \$20 million energy-from-waste plant is proposed near the Toyota car factory in north Cambridge. StormFisher Biogas of Toronto says the facility will use waste agricultural material from farms across Oxford, Perth and Wellington counties, along with food processing plants in the city. The material would be put into digesters, producing methane gas to produce electricity and solid material to be sold as fertilizer.

Toronto's second anaerobic digester, Toronto, Canada

Digester Number Two on Schedule

Construction of the city of is on schedule. Preparation of the site for the \$77.5 million, 83,000 tons/year (tpy) facility located at the Disco Waste Management Facility Station is almost complete; construction was set to begin this month. The plant is scheduled to go on-line in July 2012, processing food scraps, kitty litter, disposable diapers and other organics from the city's Green Bin curbside collection program. Full-scale operations are expected by the spring of 2013. "Everything is progressing well," says Steven Whitter, director of new infrastructure development and contracted services with the city of Toronto's Works Department. Costs include \$59 million for the facility itself, \$14 million for site preparation and a \$4.5 million contingency fund. It will include buffer tanks, enabling it to be fed 24 hours a day, seven days a week. Biogas will be used either as fuel for department trucks and buildings or to generate electricity. "We're leaning toward biomethane," Whitter says.

(Taken from [BioCycle online magazine](#))

Biogas Plant, Lethbridge, AB

Construction has begun on southern Alberta's first biogas plant, May reports. The plant will process up to 160,000 tonnes of organic waste to generate 2.85 MW of power. ECB Enviro North America Inc. and PlanET Biogas Solutions Inc. are working together on the \$30 M project, which has had government support from all levels, despite having roadblocks as it is a novel project.

(Taken from the Agrienergy Producers' Association of Ontario [news letter](#)).

Anaergia Biogas Centre

Anaergia Inc. (called UTS Biogas in Europe) will establish a centre to produce biogas and natural gas from wastewater and organic waste in Ontario with the help of the provincial government. The Government of Ontario is investing \$16 M into the project which is going to create 200 jobs.

(Taken from the Agrienergy Producers' Association of Ontario news letter).

The Nanaimo Bioenergy Centre

The Nanaimo Bioenergy Centre wishes to invest C\$3 million to upgrade gas collection facilities at the Cedar landfill to improve power-generating efficiencies and create biogas opportunities.

Biogas plant in Millbrook, Ontario

Canadian biogas company, Carbon Control Systems has teamed with German technology provider, agriKomp with the aim of becoming Canada's first turnkey anaerobic digestion system provider. Starting with a 135-kilowatt on-farm reference biogas plant in Millbrook, Ontario, the joint venture now known as CCS-agriKomp has made it their mandate to help kick start AD technology in North America. Offering tours of the biogas plant to local farmers, CCS-agriKomp plans to not only showcase proven German technology at the Millbrook build but also innovative Canadian product as well.

Alberta's Climate Change and Emissions Management Corp. (CCEMC)

Alberta's Climate Change and Emissions Management Corp. (CCEMC) announced \$15 million in new funding for biogas and biofuel projects. The projects include an anaerobic digester upgrade at a Slave Lake mill, a carbon-neutral biofuel plant near Vegreville designed to produce ethanol, cattle feed and biogas-derived electricity, and a biofuel pyrolysis plant near High Level that will produce bio-oil from sawmill residue.

City of Toronto's Second Anaerobic Digester

Construction of the city of Toronto's second anaerobic digester is on schedule. Preparation of the site for the \$77.5 million, 83,000 tons/year (tpy) facility located at the Disco Waste Management Facility Station is almost complete; construction was set to begin this month. The plant is scheduled to go on-line in July 2012, processing food scraps, kitty litter, disposable diapers and other organics from the city's Green Bin curbside collection program. Full-scale operations are expected by the spring of 2013. "Everything is progressing well," says Steven Whitter, director of new infrastructure development and contracted services with the city of Toronto's Works Department. Costs include \$59 million for the facility itself, \$14 million for site preparation and a \$4.5 million contingency fund. It will include buffer tanks, enabling it to be fed 24 hours a day, seven days a week. Biogas will be used either as fuel for department trucks and buildings or to generate electricity. "We're leaning toward biomethane," Whitter says.

(Taken from BioCycle online magazine)

Millar Western - Canada ecoTrust for Clean Air and Climate Change

Millar Western: The project recently received \$17.5 million from Alberta's \$155.9 million share of the Canada ecoTrust for Clean Air and Climate Change, which distributed \$1.5 billion among all the provinces and territories to assist with clean air and climate change initiatives.

<http://biomassmagazine.com/articles/5735/alberta-pulp-mill-proposes-biomass-plant>

West Fraser's Slave Lake Pulp Mill

West Fraser's Slave Lake Pulp mill is one of three projects approved for funding from Alberta's Climate Change and Emissions Management (CCEMC) Corporation.

<http://www.globalpapermoney.org/west-frasers-slave-lake-pulp-mill-funding-approved-for-biogas-project-cms-5659>

Current Biogas Facilities in Ontario (Taken from the [OMAFRA](#) Web site)

Phase 2 Projects - Biogas System Construction and Implementation

Phase 2 provides up to 40 per cent of construction, implementation, and commissioning costs for biogas systems. The maximum total available Phase 2 funding is up to \$400,000 for each biogas system minus any Phase 1 funding they received.

Phase 2 Projects - Biogas System Construction and Implementation (Central Ontario)		
Business Name	County/District	General Project Information
Bayview Greenhouses (Jordan Station) Inc.	Niagara	Greenhouse, electricity production and thermal energy
Vandermeer Greenhouses	Niagara	Greenhouse, electricity production and thermal energy
Maryland Farms	Kawartha Lakes	Dairy, electricity production and thermal energy – Not completed and operating yet – part of FIT projects – using 1,500 m3 CH-Four Biogas, Inc. AD

Phase 2 Projects - Biogas System Construction and Implementation (Eastern Ontario)		
Business Name	County/District	General Project Information
Pinehedge Farms Inc.	St. Eugene	Organic dairy farm and yoghurt production, electricity production, and thermal energy- Not completed and operating yet
Terryland Farms Inc.	Prescott & Russell	Dairy farm, electricity production
FEPRO Farms	Renfrew	Dairy farm, electricity production, expanding existing biogas system
Ledgecroft Farms Inc.	Leeds & Grenville	Dairy farm, electricity production
Kirchmeier Farms Inc	Prescott & Russell	Dairy farm, electricity production - Not completed and operating yet – part of FIT projects – using 1,500 m3 CH-Four Biogas, Inc. AD
Petrocorn Inc.	Prescott & Russell	Dairy farm, electricity production - Not completed and operating yet - FIT projects – using 1,500 m3 CH-Four Biogas, Inc. AD
Clearydale Farms	Grenville	Dairy farm, electricity production – Waiting for connection to the hydro grid to be completed.
Donnandale Farms Inc.	Hastings	Dairy farm, electricity production – now on line generating power for sale to the grid with the 20 year Feed-In Tariff contract. Currently generating 60 kW from manure and diesel as pilot fuel. Will be introducing fats, oils and greases shortly that will hopefully bring the output up to 500 kW
Schouton Corner View Farms Ltd.	Ottawa/Carlton	Dairy farm, electricity production– Currently islanded off the grid, running on biogas and diesel until they can get grid connection issues resolved.
Ferme Geranik Inc.	St. Albert	Dairy farm, electricity production– Not operating yet
De Bruin Farms Ltd.	Frontenac	Dairy farm, electricity production- Not completed and operating yet

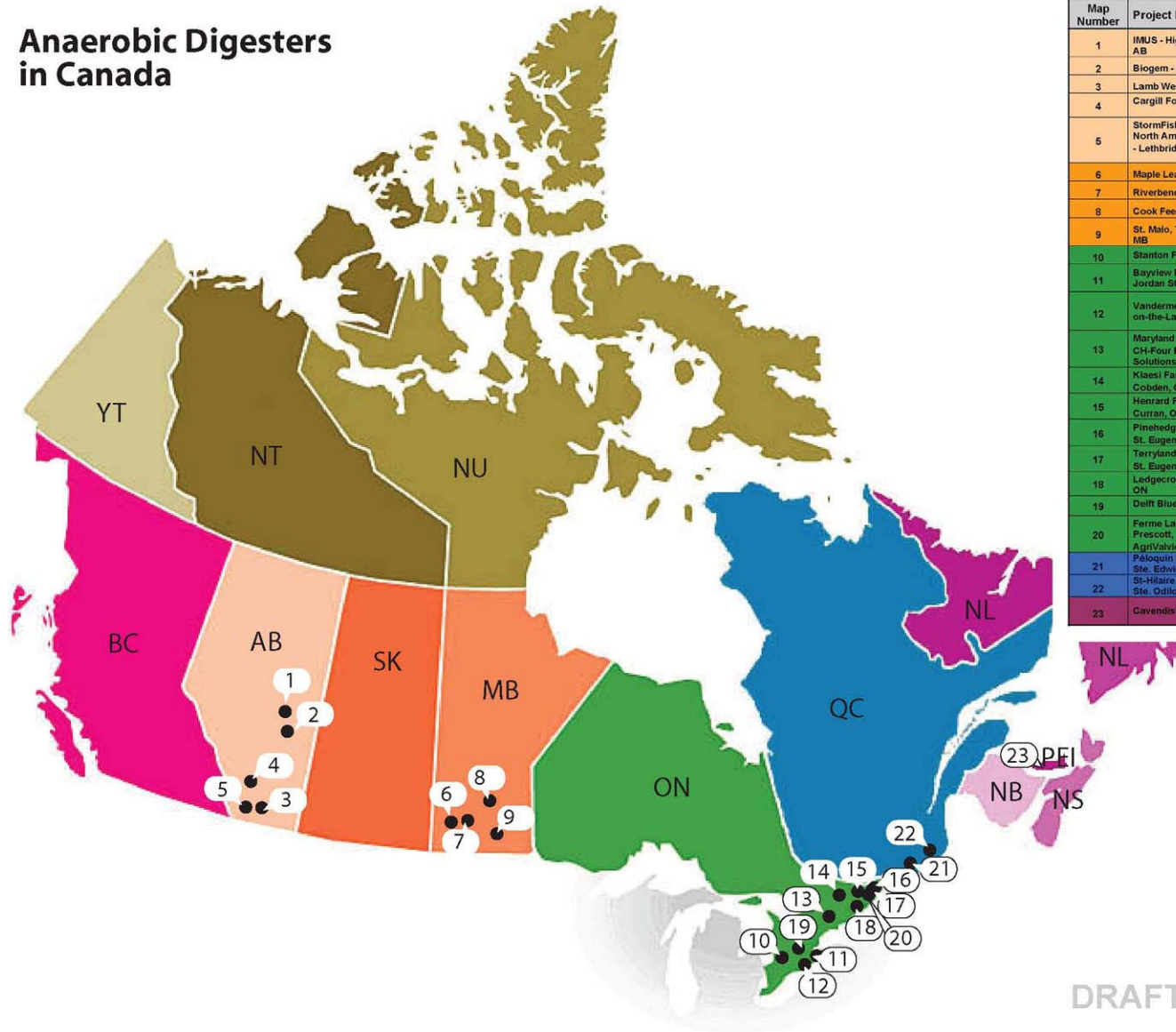
Phase 2 Projects - Biogas System Construction and Implementation (Western Ontario)		
Business Name	County/District	General Project Information
Stanton Bros. Ltd.	Middlesex	Dairy farm, electricity production
Finnie Distributing (1977) Inc.	Perth	Byproduct processor and natural gas replacement
Seacliff Energy Inc.	Leamington	Greenhouse, electricity production and thermal energy – Early 2010
Clovermead Farms Inc.	Wellington	Dairy, veal, and beef farm, electricity production - Not completed and operating yet
Delft Blue Veal Inc.	Hamilton-Wentworth	Veal farm, electricity and thermal energy - 500 kW biogas system (350 kW + 149 kW generators) – Early 2010
Ben Gardiner Farms Inc.	Perth	Beef feedlot, electricity production- Not completed and operating yet
ENS Poultry	Wellington	Beef farm, poultry processing- Not completed and operating yet

Current Biogas Facilities in Alberta

Company, Location	Feedstock	Purpose
Cargill Foods, High River	meat processing wastes	methane replaces some of the natural gas used to operate facility; odour reduction
Lamb Weston, Taber	potato renderings from potato processing	methane replaces some of the natural gas used to operate facility
Highmark Renewables, Vegreville	feedlot manure	electricity for sale to the grid; energy for operating the facility; manure management; biofertilizer
Iron Creek Hutterite Colony, Viking	various types of livestock manure and slaughterhouse wastes	energy for operating the facility; electricity for sale to the grid; manure management; water conservation; odour reduction
Peace Pork, Falher	hog manure	odour reduction; manure management

Farm Based Biogas in Canada (AD Map)

Anaerobic Digesters in Canada



Map Number	Project Name and Location	Type of Operation/Feedstock	Energy Production
1	IMUS - Highland Feeders - Vegreville, AB	5,000 head beef, manure and slurry	780 kWe + 975 kWt
2	Biogem - Iron Creek - Viking, AB	Mixed farm waste	350 kWe + 770 kWt
3	Lamb Weston - Taber, AB	Waste-water, potato sludge	Not available
4	Cargill Foods - High River, AB	Waste-water, meat processing wastes	Not available
5	StormFisher Biogas and ECB Enviro North America - Lethbridge, AB	Organic byproducts from local livestock operations, meat and food processing industries, restaurants and schools.	3.2-megawatt
6	Maple Leaf - Brandon, MB	6,000 hog finishing barn	Not available
7	Riverbend Colony - Carberry, MB	Swine manure	Not available
8	Cook Feeders/BioTerre - Teulon, MB	Swine manure	Not available
9	St. Malo, Topeka Farms - Grunthal, MB	Swine manure, silage	Not available
10	Stanton Farms - Ilderton, ON	Dairy manure	375 kW
11	Bayview Floral Greenhouse Jordan Station, ON	Greenhouse by-products, grain, glycerin, corn and animal feed	250 kW
12	Vandermeer Greenhouses - Niagara-on-the-Lake, ON	Greenhouse by-products	GE Jenbacher engine-335 kW electrical and 402 kW thermal
13	Maryland Farms, Reap, Ontario CH-Four Biogas Inc. and ANF-Solutions	800 animals, including cattle, calves and 260 milking cows	1,500 m3 AD and a 500 kW MWM generator
14	Klaesi Farms - FEPRO Farms Cobden, ON	Dairy manure, off-farm material	500kW
15	Henrad Farm Curran, ON	Pig manure, whole stillage, off-farm material	2 X 633 kW
16	Pinehedge Farm St. Eugene, ON	Dairy manure, off-farm material planned	100 kW
17	Terryland Farm St. Eugene, ON	Dairy manure, off-farm material	180 kW
18	Ledgcroft Farms Inc., Seeley's Bay, ON	Dairy manure, off-farm material	500 kW Jenbacher biogas engine-generator set
19	Delft Blue Veal Inc., Cambridge, ON	Manure, fats/oils/grease	500 kW biogas system
20	Ferme Lanidrac, Ste. Anne de Prescott, ON AgriValrio AD system Palouais farm	115 milking cows farm's dairy cow manure and neighbour's hog farm	100kW MAN single phase generator
21	St-Hilaire Farm Ste. Edwidge de Clifton, QC	Swine manure	Not available
22	St-Odilon-de-Cranbourne, QC	Swine manure	50 kW
23	Cavendish Farms, New Annan, PEI	Solid waste material from potato processing	Not available

4) Any new plants/projects funded in the biogas/AD area

Ontario

Ontario Power Authority FIT (Feed-in Tariff) Program in Ontario has new projects with an overall of (see below table):

Biogas - 6 projects with a total of 12,655 kW potential

Landfill Gas - 4 projects with a total of 14,500 kW potential

Biomass - 2 projects with a total of 18,587 kW potential

Applicant Legal Name	Project Name	Project City	Project Source	Capacity (kW)
Clearydale Farms	Clearydale Farms	Spencerville	Bio-Gas	498
De Bruin Farms Ltd.	DeBruin Farms Biogas	Wolfe Island	Bio-Gas	360
Ferme Geranik Inc	Ferme Geranik Biogas	St. Albert	Bio-Gas	499
Gillette Farms Inc.	Powerbase/Gillette Farms Inc	Embrun	Bio-Gas	498
Grimsby Energy Inc	Grimsby Bioreactor project	Grimsby	Bio-Gas	1000
purEnergy	Kawartha Biogas	Havelock	Bio-Gas	9800
Integrated Gas Recovery Services Inc	Lafleche Landfill Gas Utilization	Moose Creek	Landfill	4500
North Bay Hydro Distribution Ltd	Merrick Landfill Project	North Bay	Landfill	1600
Peterborough Utilities Inc	Bensfort Rd LFG Generation Project	Peterborough	Landfill	2000
Waste Management of Canada Corporation	WM Ottawa Landfill Gas to Energy	Ottawa	Landfill	6400
Haliburton Forest & Wild Life Reserve Ltd	Haliburton Forest Biopower 1	Haliburton	Biomass	775
Index Energy Mills Rd Corporation	Index Energy Mills Rd Corporation	Ajax	Biomass	17812

Maryland Farms

Reaboro ON

CH-Four Biogas Inc. and ANF-Solutions

600 animals, including cattle, calves and 250 milking cows

1,500 m³ AD and a 500 kW MWM generator

Maryland Farms, located in Reaboro, Ontario, started in 1870, when Jim Callaghan's ancestors immigrated to Canada from Ireland. Today, Maryland Farms is owned by two generations: Jim, Philip and their mother Aileen Callaghan and Jim's two sons Jim Jr. and Len. All family members are involved in the farm operation and work with partners in the biogas industry. Maryland Farms is a dairy farm with 600 animals, including cattle, calves and 250 milking cows. The farm's 2,500 acres grows corn, beans, hay, and wheat for animal feed and has a cash crop operation. (From APAO Newsletter)

Ferme Lanidrac

Ste. Anne de Prescottte ON

AgriValvio AD system

100kW MAN single phase generator

After conducting a feasibility study in 2007 and obtaining approval from the bank in 2009, Ferme Lanidrac installed a 700m³ AgriValvio AD in September of 2009. Before the organic waste enters the AD, it is stored for a period of three days in a hydrolysis tank, where the waste begins to decompose. This initial step increases methane output once the waste has been transferred into the AD. The farm's AD is connected to a Wiseman furnace (which runs on methane) and a 100 kW MAN single- phase generator. (From APAO web site)

Maritime Provinces

Cavendish Farms, Prince Edward Island

Krieg & Fischer/Stantec design engineer

Bio-Gas Facility - June 2009

The new facility will convert the solid waste material from potato processing into energy through anaerobic digestion.

Laforge Bioenvironmental – January 2010

A dairy farm in St. André, New Brunswick will use dairy manure and waste from the McCain Foods plant in Grand Falls to start producing enough electricity to power 200 homes a year. The biogas system is being built by Laforge. The \$2.35-million project received nearly \$904,000 from the New Brunswick Climate Action Fund.

Quebec

Four green projects have been identified as priorities and will receive federal investment of up to \$150M under the Green Infrastructure Fund of Canada's Economic Action Plan. The Government of Quebec has also allocated a financial contribution around \$165M for these projects under its own Green Fund.

The four projects involve the treatment of a large part of the organic waste generated in the city of Montreal and its municipality cities, Laval, Longueuil and south Montreal.

The goal of the projects is to establish anaerobic digestion (biomethanation) and composting facilities, more specifically utilizing the treatment of table scraps, septic sludge and organic waste from homes, factories and institutions.

The Montreal project, which is to receive a contribution of \$67M from the Government and \$68.5 from the Government of Quebec, will construct two systems to treat organic waste through anaerobic digestion, two composting centres and a pilot centre for the pre-treatment of organic waste.

Prairie Provinces

Manitoba Hydro

Manitoba Hydro will have 5 new demonstration projects at various locations throughout Manitoba in 2010. These demonstration projects also recently qualified for funding through the Government of Canada's Clean Energy Fund.

Sweetridge Farms, Winkler, Manitoba

One of the 5 demonstration projects, this one will utilize the anaerobic digestion of wet biomass. Through the use of specialized equipment, livestock manure is digested and converted into a treated effluent and biogas.

Saskatchewan - Prairie Agricultural Machinery Institute (PAMI) – May 2009

The Government of Canada is investing \$350,000 so that PAMI can develop a pilot-scale, solids-content anaerobic digester. PAMI is to construct a pilot scale solids-content anaerobic digester which determine the cost-effectiveness of converting waste to clean energy.

Alberta

Vegreville-Wainwright, Alberta

Growing Power Hairy Hill Limited Partnership to expand its biogas facility

Expansion of the existing demonstration-scale biogas plant represents the first phase in developing a larger integrated bio-refinery capable of producing products such as green power, bio-fertilizer and fuel ethanol. The project includes the construction of new biogas capacity, the commercialization of technology and installation of equipment to convert animal waste to methane, which will in turn be used to fuel two generators for producing electricity.

A repayable federal investment of \$4,143,000 is being provided through the Community Adjustment Fund (CAF) as part of Canada's Economic Action Plan.

Lethbridge, Alberta

Biogas/ Cogeneration Project

ECB & StormFisher have partnered to build a 3.2MW biogas facility in Lethbridge. On top of producing green, renewable electricity, the facility will provide a safe & sustainable disposal alternative to the agricultural & food processing industries, by processing up to 150,000t of livestock manure, food processing waste & animal by-products annually. Lastly, the facility's throughput will be dried & pelletized & sold to the agricultural & commercial organic fertilizer markets.

High River, Alberta

EcoAg Initiatives was recently approved to build a biogas generation facility in the area and some people are concerned. A new facility in the Tongue Creek area west of High River has some residents up in arms.

British Columbia

Anaerobic Digestion Initiative Advisory Committee of BC (ADIAC)

Website providing news and updates on recent AD Projects in British Columbia

http://www.bcfarmbiogas.ca/development_steps/exampleprojects

UBC Point Grey Campus - Nexterra Systems Corp.

Demonstration of Heat and Power from Biomass Gasification

UBC Point Grey Campus, Vancouver, British Columbia

Project will showcase biomass gasification integrated with an internal combustion engine generator in a novel, small-scale combined heat and power demonstration suited for on-site applications at public institutions, industrial facilities, and northern and remote Canadian communities. The project has the potential to overcome the difficulty of gas clean up and opens up the possibility of significant replication in Canada and overseas.

Nata Farms, Armstrong, BC

Anticipated Commissioning - January 2011

Technology Supplier - ReNew Energy, partnering with Quadrogen Power Systems Inc.

Digester type: Thermophilic digester

Feedstock: Manure from cattle and brewery waste

Bakerview EcoDairy, Abbotsford, BC

Technology supplier: Avatar Energy

Digester description: Scalable modular plug flow with trickling filter system

Feedstock: Manure from 50 lactating cows and locally produced whey and bakery byproducts

Output uses: On-farm electricity and heat, cow bedding and fertilizer

Greatest challenge: Funding availability

Progress to date: 7/10

Anticipated commissioning: Comissioned

Catalyst Power Inc., Abbotsford, BC

Project Proponent: Chris Bush

Technology supplier: PlanET Biogas Solutions website

Digester description: Complete mix mesophilic, 24 meter diameter tanks by 6 meter high

Feedstock: Dairy and poultry manure (200 tonnes/day) and food processing waste (40 tonnes/day)

Output uses: Biogas upgraded to natural gas specifications and digestate used for fertilizer and bedding

Greatest challenge: Lack of guidelines and regulations as this was the first on-farm digester in BC

Anticipated commissioning: May 2010

Vantreight Farms, Victoria, BC

Digester description: Three complete mix mesophylic digesters

Feedstock: Sewage sludge/bio solids and organic waste

Output uses: On-farm electricity and heat (potential community heating loop and sale of excess electricity/biomethane) and fertilizer

Greatest challenge: Regulatory barriers at the provincial and regional level

Anticipated commissioning: Unknown

5) Any new reports in the biogas area that can be distributed / accessed

Industrial and Agricultural Anaerobic Digestion Potential in Canada

BBI Biofuels Canada – 2008 (Online Presentation with Audio)

http://chem-eng.utoronto.ca/~saville/Slides/Anaerobic_Digestion_NRCan.WMV

CanBio

Canada Report on Bioenergy 2009

<http://www.canbio.ca/documents/publications/canadacountryreport2009.pdf>

Methane to Markets Partnership Landfill Subcommittee Country-Specific Profile and Strategic Plan for Canada

http://www.methanetomarkets.org/documents/landfills_cap_canada.pdf

Useful Bio Web site: <http://www.thebioenergysite.com/index.php>

Ontario Biogas Systems Financial Assistance (OBSFA) Program Projects:

http://www.omafra.gov.on.ca/english/engineer/biogas/proj_list.htm

6) Any planned meetings in the biogas area that may be of interest

Growing the Margins Annual Canadian Farm and Food Biogas Conference and Exhibition

<http://www.gtmconference.ca/site/>

Biogas Policy Drivers

1. Climate change / environmental
- reducing net GHGs
2. Clean water and air

3. Renewablw energy / energy diversification
4. Rural economic development and revitalization
5. Creation of economically viable natural resource-based enterprises in rural Canada and reduction of subsidies
6. Farmer ownership of ethanol and biodiesel production facilities would enhance rural community development
7. Farm income
8. New market opportunities for grains, oilseeds and other feedstocks
9. The emerging bioeconomy
10. Production of new products from natural resources

Additional Miscellaneous Notes and Reports

The Ontario Agricultural AD Calculator

Robert Anderson (University of Guelph), Donald Hilborn and Chris Duke (Ontario Ministry of Agriculture, Food and Rural Affairs) and Jonathan Cheszes (Navigant Consulting) explored some of the challenges associated with economics and operations of biogas-to-energy projects. The Ontario Agricultural AD Calculator, a tool for assessing the economic feasibility of biogas facilities on Ontario farms, has been developed to help farmers assess expected quantifiable benefits and costs associated with construction and operation of these projects. The variables with the top 3 most significant effect on return on investment were price of sold power, price of system (capital cost) and electrical efficiency. Costs of material input (on farm or tipping fees) ranked fourth and project lifespan fifth or lower. Transportation costs did not rank very high. Spreadsheet predicts current practices should not include energy crops, should blend off-farm materials, and systems >100kW will be most viable. The Ontario FIT program can provide farms with return on expenditures (ROE) of greater than 20% when considering all contract provisions and outperforming base case assumptions.

(Taken from Agrienergy Producers' Association of Ontario Agricultural Bioenergy Conference Report)

Agrienergy Producers' Association of Ontario Monthly Newsletters

Agrienergy News with monthly updated newsletters can be viewed on [APAO's web site](#).

Agrienergy Producers' Association of Ontario

Biogas Tour and Workshop Series

www.apao.ca

Funding for Anaerobic Digestion Plant

CANADA - The BC Bioenergy Network, a provincially-funded leader supporting the growing bioenergy sector in British Columbia, is granting C\$1,500,000 to Elemental Energy Inc to demonstrate Paradigm Environment Technologies' MicroSludge and anaerobic digestion at Catalyst Paper's Crofton-based pulp and paper mill on Vancouver Island.

<http://www.thebioenergysite.com/news/7706/funding-for-anaerobic-digestion-plant>

New World Dairy, Newfoundland's largest dairy farm and the third largest in Canada, will soon be much greener. That's due to the upcoming installation of an anaerobic digester and methane gas capture system.

<http://www.thewesternstar.com/Business/Agriculture/2010-05-15/article-1478316/New-World-Dairy-going-green-with-new-manure-digester-system/1>

Government of Canada Helps Producers Boost Energy Efficiency and Sustainability

\$86,000 towards Benchmarking Anaerobic Digestion Feasibility across B.C.'s Agriculture and Agri-Food Sector, led by the B.C. Agricultural Research and Development Corporation, to help turn on-farm challenges into revenue streams that support the sector's economic viability and environmental sustainability. The project goals are to determine the feasibility of installing anaerobic digestion systems on demographically and geographically diverse agriculture and agri-food operations in B.C.; facilitate implementation of these digestion systems by providing technical, economic and logistical benchmarks; and provide revenue stream estimates to meet return on investment targets.

http://www.agr.gc.ca/cb/index_e.php?s1=n&s2=2011&page=n110315a

Clean Energy Fund Renewable Energy and Clean Energy Systems Demonstration Project

Bioenergy Optimization Program Demonstration

Lead proponent: Manitoba Hydro

Strategic Area: Bioenergy

Location: Five locations in Manitoba

Purpose: This project is comprised of five different bioenergy systems at five different project sites. The project demonstrates collaboration between utility companies and customers. It is anticipated that the project will help to remove the perceived barrier of technical and operational risk and will promote the wide-scale adoption of bioenergy systems in Canada.

<http://www.nrcan-rncan.gc.ca/media/newcom/2010/201078-eng.php>

Food and Yard Waste Anaerobic Digestion to Electricity Demonstration

Lead proponent: Harvest Power Canada Ltd.

Strategic Area: Bioenergy

Location: Fraser Richmond Soil and Fibre, British Columbia

Purpose: This project would be Canada's first high-efficiency system for producing up to 1 MW of renewable energy from food and yard waste. If successful, this technology has the potential to be rapidly deployed across Canada as a mechanism to divert food wastes from landfills and produce renewable energy.

<http://www.nrcan-rncan.gc.ca/media/newcom/2010/201087-eng.php>

Demonstration of Heat and Power from Biomass Gasification

Lead proponent: University of British Columbia

Strategic Area: Bioenergy

Location: UBC Point Grey Campus, Vancouver, British Columbia

This project will showcase biomass gasification integrated with an internal combustion engine gen-set in a novel, small scale combined heat and power demonstration suited for on-site applications at public institutions, industrial facilities, northern and remote Canadian communities. This project has the potential

to overcome the syngas condition/clean-up hurdle and opens up the possibility of significant replication in Canada and overseas. Please click here for further information.

<http://www.nrcan-rncan.gc.ca/media/newcom/2011/201126-eng.php>