Overview
The BC Ministry of Agriculture and Stantec Engineering are looking for ten (10) agricultural operations from across B.C. to participate in a solar-thermal benchmarking feasibility study.

This project will evaluate the feasibility of solar-thermal heating and cooling systems at each of the selected agricultural operations to provide owners with a professional assessment of the solar-thermal opportunities at their site. Results from the ten sites will also be compiled into a larger benchmarking study to provide other agricultural operations in B.C. with the information and tools needed to perform a preliminary self-evaluation of solar-thermal feasibility at their own site.

The ten (10) agricultural operations will be chosen based on responses to the attached questionnaire.

Each of the participating agricultural operations must contribute $4,000 (+ HST) towards the preparation of their own study. These studies usually cost $15,000 - $20,000 so participants in this study will save approximately 73% – 80% of the cost of a typical feasibility study.

Funding for this program has been provided by Agriculture and Agri-Food Canada and the BC Ministry of Agriculture under Growing Forward, a federal-provincial-territorial initiative.

Who might be interested
- Farm operators (dairy, hog and poultry), greenhouses, and food processing/storage facilities with heating and/or cooling needs for building temperature or humidity control; and
- Farm and agri-food operations with process heating and/or cooling requirements (e.g. milk cooling, hot wash water, pasteurizing, etc.)

How to apply
If you are interested in participating in this project, please complete the attached application, answering as many of the questions as you can, and email it to Colleen Colwell at Colleen.Colwell@gov.bc.ca or fax it to (250) 356 5367 by 23rd September 2011 at midnight PST. You do not have to answer all of the questions to submit the application. Incomplete applications will be accepted.

If you are not able to complete the application, but have serious interest in participating, please contact Colleen Colwell as soon as possible. Email: Colleen.Colwell@gov.bc.ca Phone: (250) 356-0488 Fax: (250) 356-5367

Successful applicants will be notified within 2 weeks of the application deadline
SOLAR-THERMAL APPLICATION

IF COMPLETING THIS APPLICATION IN WORD (NOT PDF) ON YOUR COMPUTER: to tick the boxes in this application, move the mouse cursor over the appropriate box and double click the left mouse button. You must then select the ‘checked’ option under ‘default value’ in the dialogue box that appears. To close the dialogue box simply click ‘OK’.

Applicant information
1. Please provide your contact information:
   - Your name:
   - Business name:
   - Your phone number:
   - Your email:

2. Please provide the specific physical address of the agricultural operation on which your proposed solar-thermal system will be located:
   - Address:

3. If possible, please provide the GPS co-ordinates of where your proposed solar-thermal system will be located. To do this, either enter known GPS co-ordinates, or use Google maps (http://maps.google.ca/). Once you have opened the Google map page and found the specific location on the map, put the mouse cursor on the location and right click the mouse. Select ‘what’s here?’ from the small white box and the GPS coordinates will be in the search bar at the top of the screen (e.g., 49.265262,-123.17256):
   - Co-ordinates:

4. Please describe the type(s) of agricultural activity undertake at the site where your proposed solar-thermal system will be located (e.g., dairy farm, greenhouse operation, food processor, etc.):
   - Activity:

5a. Please specify if the agricultural operation on which your proposed solar-thermal system will be located has completed an Environmental Farm Plan within the past five years?
   Yes ☐ No ☐

5b. If you answered ‘yes’ to question 5a, has any funding from the Environmental Farm Plan been used to fund a project on the agricultural operation in the past?
   Yes ☐ No ☐ Don’t want to say ☐
**Building heating information**
Only answer questions 6 if **you use fresh ventilation air in the building(s)** at your agricultural operation.

**6a.** Please specify if you use fresh ventilation air for any of the building(s) at your agricultural operation?
Yes ☐ No ☐ (if ‘no’ move onto question 7)

**6b.** Please specify the number of building(s) that use fresh ventilation air at your agricultural operation?
One ☐ Two ☐ Three ☐ Four ☐ Five ☐ Six+ ☐

**6c.** Please specify the ventilation air requirements of the building(s) at your agricultural operation?
Less than 1,000 litres/sec (2,000 cfm) ☐ 1,000 – 2,400 litres/sec (2,000 – 5,000 cfm) ☐
Greater than 2,400 litres/sec (5,000 cfm) ☐ Don’t know ☐

**6d.** Please describe what the ventilated building(s) are used for at your agricultural operation?
- Building use:

**6e.** If any of the ventilated buildings at your agricultural operation are used to house animals, please specify the type and number of animals housed in these building(s)?
- Type:
- Number:

**6f.** Please specify the minimum and maximum temperatures (°C or °F) that the ventilated building(s) at your agricultural operation are maintained at?
- Minimum temperature:
- Maximum temperature:

**6g.** Please specify the minimum and maximum temperatures (°C or °F) that the fresh ventilation air is delivered to the building(s) at your agricultural operation?
- Minimum temperature:
- Maximum temperature:

**6h.** Please specify if your answers to question 6f and 6g change with the process or time. For example, the required temperature of a poultry barn can change as the birds age.
Yes ☐ No ☐
6i. If you answered ‘yes’ to question 6h, please provide more information?

- Information:

6j. Please describe the type of system used to ventilate the building(s) at your agricultural operation?

- Single fan
- Multiple fan
- Heat recovery
- Other (specify):

6k. Please specify (if known) the capacity (kW, btu/h, etc.) of the system used to ventilate the building(s) at your agricultural operation?

- Heating capacity:
- Cooling capacity:
- Volume capacity:

6l. If you are unable to answer question 6k, please provide as much information as you can about the make and model of the system used to ventilate the building(s) at your agricultural operation?

- Make:
- Model:

6m. Please specify how many days per week ventilation air is typically required for the building(s) at your agricultural operation?

- Less than three
- Four – five
- More than five

6n. Please specify how many hours per day ventilation air is typically required for the building(s) at your agricultural operation?

- Less than six
- Seven – twelve
- Thirteen – eighteen
- More than nineteen

6o. Please specify the type of fuel used in the ventilation air system at your agricultural operation?

- Natural gas
- Propane
- Electricity
- Biomass
- Other (specify):

6p. Please specify (if known) the age of the ventilation air system used at your agricultural operation:

- 1 – 3 years
- 4 – 7 years
- 8 – 10 years
- 10 years +
- Unknown
**Process hot and chilled water information**

Only answer questions 7 and 8 if you *use process hot and/or chilled water* at your agricultural operation.

**7a.** Please specify if you use hot water at your agricultural operation (such as pasteurising milk, wash water, etc)?

Yes [ ] No [ ] (if ‘no’ move onto question 8)

**7b.** Please describe what you use the hot water for at your agricultural operation (e.g., pasteurising milk, wash water, etc):

- Description:

**7c.** Please specify how much hot water (litres or gallons) you typically use at your agricultural operation on a daily basis?

Less than 300L (80gal) [ ] 301 – 600L (81 – 160gal) [ ] More than 601L (161gal) [ ] Don’t know [ ]

**7d.** Please specify the temperature (°C or °F) required for the hot water used at your agricultural operation?

Less than 50°C (120°F) [ ] 51 – 80°C (121 – 180°F) [ ] Above 80°C (181°F) [ ] Don’t know [ ]

**7e.** Please describe the type of system used to provide hot water for your agricultural operation?

Gas fired boiler [ ] Electric boiler [ ] Biomass boiler [ ] Heat recovery [ ] Other (specify):

**7f.** Please specify (if known) the capacity (kW, btu/h, etc.) of the equipment used to generate hot water for your agricultural operation?

- Capacity:

**7g.** If you are unable to answer question 7f, please provide as much information as you can about the make and model of the system used to generate hot water at your agricultural operation?

- Make:
- Model:

**7h.** Please specify how many days per week hot water is typically required for your agricultural operation?

Less than three [ ] Four – five [ ] More than five [ ]
7i. Please specify how many hours per day hot water is typically required for your agricultural operation?
Less than six □    Seven – twelve □    Thirteen – eighteen □    More than nineteen □

7j. Please specify (if known) the age of the equipment used to provide process heat for your agricultural operation:
1 – 3 years □    4 – 7 years □    8 – 10 years □    10 years + □    Unknown □

8a. Please specify if you use chilled water at your agricultural operation (such as for cooling milk, product chilling, etc)?
Yes □    No □ (if ‘no’ move onto question 9)

8b. Please describe what you use chilled water for at your agricultural operation (e.g., cooling milk, product chilling, etc):
- Description:

8c. Please specify the approximate supply / return temperatures (°C or °F) and flow rates of the chilled water at your agricultural operation?
- Supply temperature:
- Return temperature:
- Volume/flow rate:

8d. Please specify if you have any refrigeration at your agricultural operation?
Yes □    No □

8e. If you answered ‘yes’ to question 8d, please estimate how much refrigeration you have at your agricultural operation?
Under 70kW (20tons) □    71 – 350kW (21 – 100tons) □    Above 351kW (101tons) □    Don’t know □

8f. Please specify (if known) the capacity (kW, btu/h, etc.) of the equipment used to generate process cooling at your agricultural operation?
- Capacity:
8g. If you are unable to answer question 8f, please provide as much information as you can about the make and model of the system used to generate process cooling for your agricultural operation?

- Make:
- Model:

8h. Please specify if there is a source of hot water above 80C (180F) with an available flow in excess of 2.5 litres/sec (40 gpm) at your agricultural operation?

Yes [ ] No [ ] Don’t know [ ]

8i. Please specify if your agricultural operation has use for warm water at 25C (80F) at the same time as the process cooling needs occur?

Yes [ ] No [ ] Don’t know [ ]

8j. Please specify if your agricultural operation has packaged rooftop air conditioners of 10 tons or larger?

Yes [ ] No [ ] Don’t know [ ]

8k. Please specify how many days per week process chilling is typically required for your agricultural operation?

Less than three [ ] Four – five [ ] More than five [ ]

8l. Please specify how many hours per day process chilling is typically required for your agricultural operation?

Less than six [ ] Seven – twelve [ ] Thirteen – eighteen [ ] More than nineteen [ ]

8m. Please specify (if known) the age of the equipment used to provide process chilling for your agricultural operation:

1 – 3 years [ ] 4 – 7 years [ ] 8 – 10 years [ ] 10 years + [ ] Unknown [ ]

Energy supply information
9a. Please specify if you have single phase or three-phase power supplied to your agricultural operation?

Single phase [ ] Three-phase [ ] Don’t know [ ]
9b. Please specify (if known) your current electrical service capacity (in amps)?
   200 A [ ]  400 A [ ]  Don’t know [ ]  Other (specify): [ ]

9c. Please specify (if known) your current voltage capacity?
   120 V [ ]  208 V [ ]  Don’t know [ ]  Other (specify): [ ]

10a. Please specify if you have natural gas supplied to your agricultural operation?
   Yes [ ]  No [ ]

10b. If you answered ‘no’ to question 10a, please estimate how far (in Meters) the nearest natural gas pipeline is from your agricultural operation?
   Less than 1km [ ]  Over 1km [ ]

11. Please specify if you have the past five (5) years worth of utility bills available for your agricultural operation and are willing to share these with the solar-thermal consultant?
   Yes [ ]  No [ ]

**Site potential**

12a. Please estimate how much open space (m² or ft²) is available within 100 meters of the building(s) for solar collectors at your agricultural operation that use heating and/or cooling (this can be roof area, wall area or land area)?
   Less than 100m² (1,000ft²) [ ]  101 – 300m² (1,001 – 3,000ft²) [ ]  Greater than 301m² (3,001ft²) [ ]

12b. For the open space mentioned in question 12a, please specify how many hours a day this space is in direct sunlight?
   Less than eight [ ]  Nine – sixteen [ ]  More than seventeen [ ]

12c. For the open space mentioned in question 12a, in which direction is this space facing (tick all that apply)?
   North [ ]  East [ ]  South [ ]  West [ ]

12d. How much of the open space mentioned in question 12a would you be willing to give up to install a solar-thermal system?
   None [ ]  Some [ ]  Most [ ]  All [ ]
13a. Please specify if you anticipate any changes to your current agricultural operation in the next few years (e.g., expansion, new building, production change, etc)?

Yes [ ], No [ ], Maybe [ ]

13b. If you answered ‘yes’ or ‘maybe’ to question 13a, please provide more information?
- Information:

13c. If you answered ‘yes’ or ‘maybe’ to question 13a, please specify what this expansion would result in?
- Retrofit [ ], New building [ ], Other (specify): [ ]

Neighbouring site information
Only answer question 14 if there is a nearby operation(s) that uses heating and/or cooling for buildings and/or processing.

14a. Please specify if there are any other operation(s) within 200 meters of your agricultural operation that use heating and/or cooling for buildings and/or processing?

Yes [ ], Maybe [ ], No [ ] (if ‘no’ move onto question 15)

14b. If you answered ‘yes’ or ‘maybe’ to question 14a, have you discussed the potential of supplying heat or cooling from your proposed solar-thermal system to these operation(s)?

Yes [ ], No [ ]

14c. If you answered ‘yes’ to question 14a, please provide the following information for each of these operation(s)?

- Operation
  - Contact name:
  - Phone number:
  - Address:
  - Type of operation:

- Operation
  - Contact name:
  - Phone number:
  - Address:
  - Type of operation:
14d. If you answered ‘yes’ or ‘maybe’ to question 14a, how far (in meters) are these operation(s) from your operation, and are there any potential obstacles (such as a road, other properties) between your operation and the other operation(s) in question?

- Operation
  - Distance:
  - Potential obstacles:

- Operation
  - Distance:
  - Potential obstacles:

14e. If the solar-thermal technology could be scaled to provide heat supply to other operation(s), please specify if you would be interested in a feasibility study that involves both operations?

Yes ☐ No ☐ Maybe ☐

**Study details**

15a. If selected for this study, do you agree to make all non-sensitive information in your study publically available?

Yes ☐ No ☐

15b. If you answered ‘no’ to question 15a, please specify the type of information you would like to keep private?

- Information:

15c. Please specify if you would be willing to attend specific events, such as the Pacific Agriculture Show in Abbotsford, to participate in information sharing events with others interested in solar-thermal systems?

Yes ☐ No ☐ Maybe ☐

16a. Please specify if you are willing to spend one day with a solar-thermal consultant at your agricultural operation in October or November of 2011 to discuss your proposed solar-thermal system?

Yes ☐ No ☐

16b. Please specify if you are willing to provide the solar-thermal consultant with all necessary energy and logistics information necessary to inform the feasibility study?

Yes ☐ No ☐
16c. If you answered ‘no’ to question 16b, please describe what information would you be unwilling to share?
   • Information:

17. If your feasibility study comes back as economically viable, are you prepared to invest the necessary capital to build the solar-thermal system in the next 12 – 24 months?
   Yes ☐     No ☐    Maybe ☐

18. Please describe how you expect the solar-thermal system to improve the efficiency and profitability of your agricultural operation?
   • Improvement:

19. Are you willing to contribute $5,000 (+HST) of your own money to the feasibility study? (payable in full prior to the solar-thermal consultant’s site visit). If you answer ‘no’, your farm/facility will not be eligible to partake in this study.
   Yes ☐     No ☐

20. Please provide any other information you think might help demonstrate the suitability of your agricultural operation for inclusion in this study?
   • Information:

**Certification**
I hereby certify that the information contained in this application is true and complete in all respects to the best of my knowledge. If it is discovered that this application contains a material misrepresentation, it shall be deemed to be ineligible and withdrawn immediately.

   • Printed Name:

   • Organization:

   • Signature:

   • Date: