



Climate Action Initiative  
BC AGRICULTURE & FOOD

BC Dairy Industry Conference

# ENERGY EFFICIENCY IMPROVEMENTS FOR DAIRY FARMS

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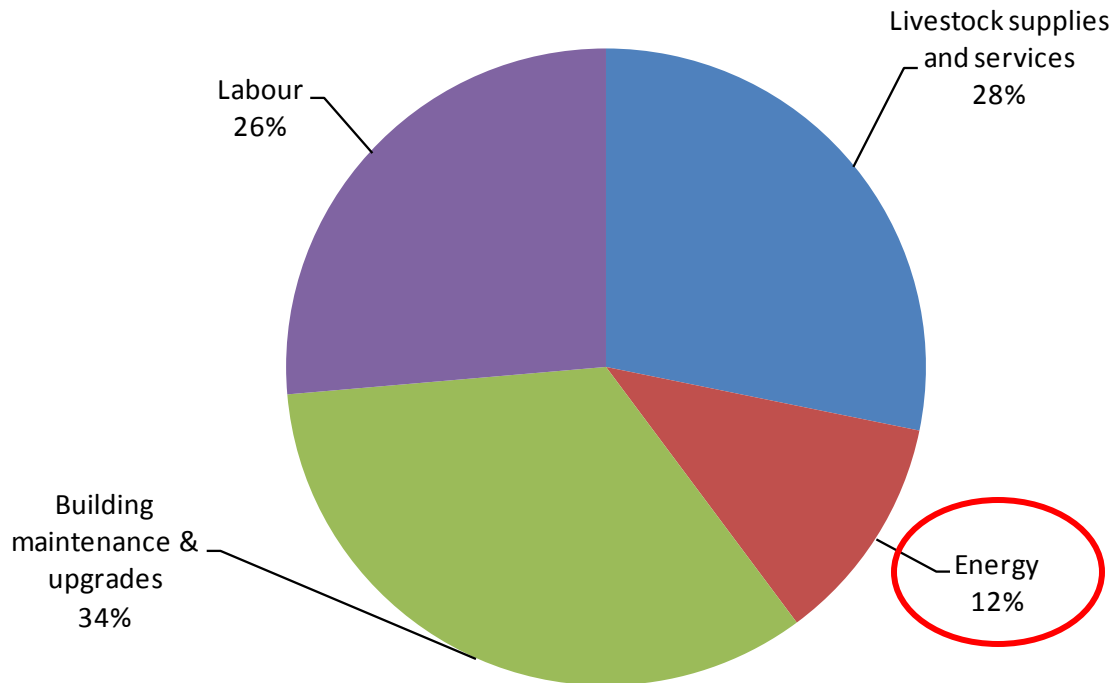
*November 30<sup>th</sup> 2011*

# Overview

1. Background / Introduction
2. The energy context for Dairy farms
3. Common Energy Management Opportunities & Incentives
4. Implementation & the BC Farms Energy Advisor

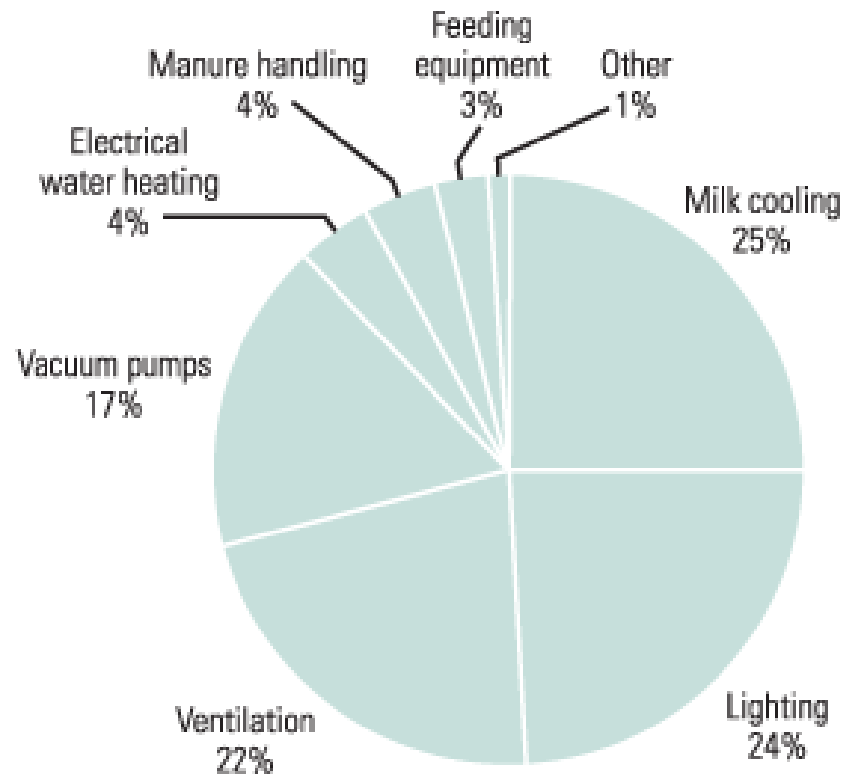
# The energy context

## Expenditure breakdown - Typical dairy farm



Source: BCMAFF - 2001 - Dairy - Fraser Valley 100 cow dairy operation (self grown feed)

# Energy use — Electrical energy use breakdown



© E source; data from New York State Research and Development Authority Dairy Farm Energy Audit Summary

# Energy Management Opportunities

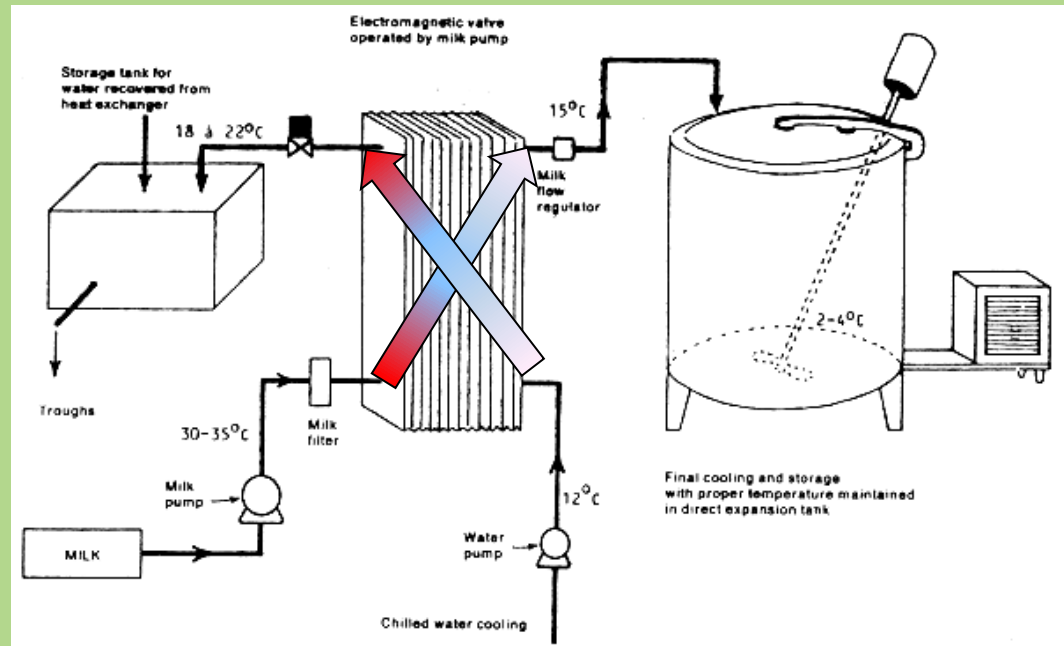
- 5 Common opportunities for BC dairy farms:
  1. Milk pre-cooler
  2. Heat recovery of refrigeration condenser line
  3. Time-clock or isolation valves on air compressors
  4. Lighting upgrades
  5. Insulation – hot water tanks and lines

# 1. Milk pre-cooler

- Use well water to cool milk via heat exchanger prior to milk arriving at cooling tank.
- Well water is warmed and can be used for watering troughs.

20-25% savings on compressor energy.

Around \$600/yr savings for 135 cow operation.



## 2. Heat recovery of refrigeration condenser line

- Recover heat from condenser side of milk refrigeration system and use to pre-heat washing water.
- Either *de-superheater* (photo below) or *full-condensing* (integrated water only – no air side)

40-50% savings on hot water heating (if no pre-cooler).

Around \$1,000/yr savings for 135 cow operation (nat. gas heating)

**INCENTIVES:**  
-BMP (Env. Farm Plan)\*



### 3. Time-clock or isolation valves on air compressors

- Air compressors often run unnecessarily, especially if there are leaks.
- Installing a time-clock or automatic isolation valves on air compressors can be cost effective.

5-25% savings on air compressor energy.

\$500/yr savings for a 130 cow operation visited (electric heat)



## 4. Lighting upgrades

- Replace incandescent lamps with compact fluorescents or LED.
- Replace T12 (fat) fluorescent lamps with T8 or T5 (skinny) lamps.
- Use natural lighting whenever possible.

### INCENTIVES:

- BC Hydro
- BMP (Env. Farm Plan)

Savings are variable. Lighting accounts for around  $\frac{1}{4}$  of electricity bill in typical dairy barn. If 25% lighting energy can be saved, this is 6% of total electricity bill (\$500 for typical).



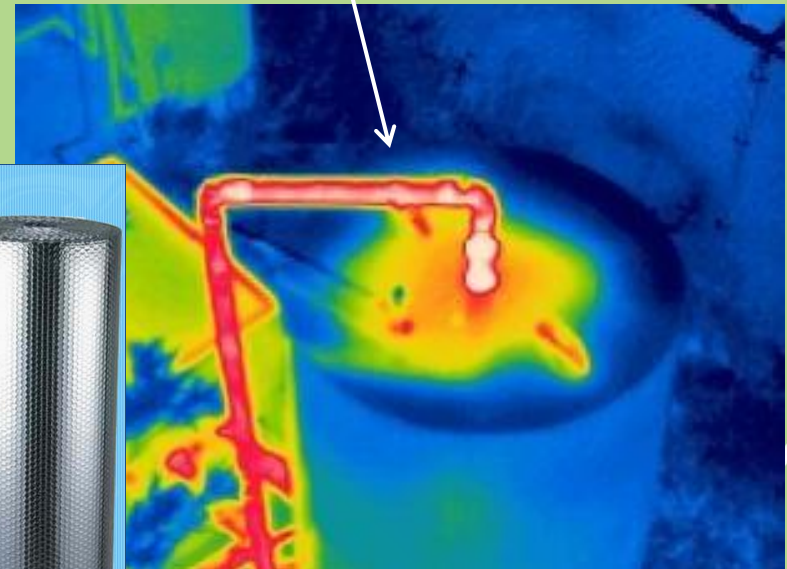
## 5. Insulation – tanks and lines

- Insulation of hot water tanks and pipes
- Insulation of refrigeration lines
- Insulation of milk storage tank

**INCENTIVES:**  
-BMP (Env. Farm Plan)\*

Savings will vary.  
5-10% of heating energy for pipe insulation.  
20-30% of heating energy for HW tank insulation.  
15-25% of cooling energy for milk tank insulation.

Un-insulated hot water pipe



# Take home list...



- 10 quick wins, zero/low cost, [no excuse!](#)
  1. Ensure hot water heating set-points are as low as possible;
  2. Repair dripping hot water faucets;
  3. Ensure air-cooled condensers are clean and free of obstructions;
  4. Check vacuum levels and reduce if possible;
  5. Repair compressed air leaks;
  6. Install time-clocks on air compressors (low cost);
  7. Turn out lights when not needed;
  8. Livestock waterer – do not heat above 5-8 degC
  9. Check for loose or worn pump/fan belts and tighten or replace;
  10. Clean dirty fan blades.

BC Hydro  
incentive

# Next steps...



## To reduce energy costs at your facility:

1. Start by having a **Farm Energy Assessment** (FEA) conducted – contact your Environmental Farm Plan Planning Advisor to apply.
2. **Implement non-capital** and simple opportunities immediately.
3. **Prioritize** capital-intensive opportunities based on which options present the best business case.
4. **For technical assistance and a point of contact on any issues relating to project implementation, financial analysis, and energy savings, contact the BC Farm Energy Advisor (myself)**
5. **Access incentive funding** where available. Contact the following people to access incentive funding where available:
  1. BC Farm Energy Advisor (myself) - Any incentive queries, including BC Hydro & Fortis BC.
  2. Environmental Farm Plan Planning Advisors – BMP related funding.
6. **Implement capital** opportunities.
7. Enjoy your cost savings and environmental benefits

# Project partner acknowledgements:

- **BC Farm Energy Assessment Pilot projects**
  - Completed in summer of 2011
  - Funding provided by: Fortis BC, BC Hydro, Investment Agriculture Foundation of BC
  - Other project partners: ARDCorp, BC Ministry of Agriculture
  - Project development and implementation through the BC Agriculture Council's Climate Action Initiative
- **Farm Energy Assessments**
  - Cost share funding for assessments (up to \$2,500 available per assessment)
  - Made available through the through the Environmental Farm Plan & Beneficial Management Practices Programs (See handout for contact information)
- **Agriculture Energy Advisor**
  - Funding from Livesmart BC Small Business Program, Ministry of Energy & Mines
  - Assistance available for implementation of energy efficiency opportunities until March of 2013



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Thank you. Questions....

Presentation available at:

[www.bcagclimateaction.ca](http://www.bcagclimateaction.ca) (Latest Documents)

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