Dairy Module Data Worksheet

Use this worksheet to collect the information you will need to complete the on-line energy assessment tool. Use your best estimate

Average pounds of milk produced per day? _____ lbs/day

How many days per year are cows milked? _____ days/year

Average temperature of your well water: _____ degrees

Average cost of electricity ($/kWh including misc. fees): _____ $/kWh

Refrigeration System

Total number of refrigeration compressors used to cool milk: _____

Number of scroll type compressors (enter 0 if unknown): _____

Hot Water Usage – include only hot water uses in the dairy facility

Hot water heater temperature setting (160-180°F typical): _____°F

Fuel used for water heating and cost (limit one type):

Electricity _____ $/kWh Natural Gas _____ $/therm

Propane _____ $/gallon Heating Oil _____ $/gallon

Size of bulk tank #1: _____ gallons Circle how often this tank is washed

Twice/day Once/day Every other day

Size of bulk tank #2: _____ gallons Circle how often this tank is washed

Twice/day Once/day Every other day

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Milking System Water Usage

Type of Facility (check or circle)

Tie stall barn	Para-bone parlor
Flat barn Parlor	Herringbone parlor
Parallel Parlor	

Number of parlor stalls or tie stalls serviced by mild pipeline: _____ stalls

Number of milking units used during milking: _____ units

Do you use permanently installed milk meters? YES NO

How many times per day are cows milked? _____ times

Average length of each milking: _____ hours

Number of times per day milking system is washed: _____ times

Size of milk pipeline: _____ inches

Towel Laundering

Enter zero loads if towel laundering is not served by same water heater as the dairy

Number of loads per day: _____ loads

Type of washing machine used (circle or check)

Top load Residential front load Commercial front load

Wash/rinse cycles (circle or check)

Hot/Hot	Warm/Warm
Hot/Warm	Warm/Cold
Hot/Cold	Cold/Cold

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Other Hot Water Uses in the Dairy Facility

Indicate the number of gallons of hot water used for each of the following purposes:

Calf Feeding (typically 1 gallon/day/calf) _____ gallons/day

Spraying off milking equipment/general cleaning _____ gallons/day

Hand-washed equipment _____ gallons/day

Other purposes not listed above _____ gallons/day

Vacuum Pumps

Indicate the horsepower of pump #1 (circle or check):

5 7.5 10 15 20 30

Indicate the horsepower of pump #2 (circle or check if applies):

5 7.5 10 15 20 30

Indicate the type of electrical power used (circle or check):

Single Phase Three Phase

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The following data is needed for the ventilation and livestock water fountain online tools (separate from the dairy tool):

Ventilation

Indicate the type of housing used and provide sizing information as required below:

Tie Stall barn Freestall barn Bedded Pack Barn

Exhaust Fans

Fan Size	Number of fans	Hours of use per year	Thermostatically Controlled (yes/no)
24”			
36”			
48”			
50-54”			

Water Fountains

Water Fountain Type or Model	Type of Animal Served by Fountain	Number of Water Fountains	Fountain Location (inside/outside)	Average Number of Animals per Fountain

This form was developed for use with the USDA’s Energy Conservation tools. Enter the data from this form at: http://www.ruralenergy.wisc.edu/conservation/dairy/default_dairy.aspx to complete this assessment.

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Grain Drying Assessment Tool

Dryer/Information

Select Type of Dryer:

_____ Low Temperature Bin Dryer

_____ Natural Air Bin Dryer

_____ High Temp Batch Bin Dryer

_____ Mixed Flow Dryer

_____ Combination High/Low Drying

_____Cross Flow Batch Dryer

_____ Continuous Flow In-Bin Dryer

_____ Continuous Cross Flow Dryer

_____ Roof Dryer

Is a stirring device being used? YES NO

Mixed flow dryer and continuous cross flow dryers only: Is dryer a heat/cool or full heat dryer? Heat/Cool Full Heat

Full heat dryer only: is in-bin cooling being practiced? YES NO

Full heat dryer only: is dryeration being practiced? YES NO

Heat cool dryer only: does the dryer have suction/reverse-flow cooling or external heat recovery? YES NO

Energy Costs

Do you use gas for drying? If so, which type? Propane Natural Gas

What is the cost per gallon of fuel? _____ $/gallon

What is the cost per kWh of electricity? _____ $/kWh

Production and Energy Use History

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Do you have records for fuel use and average harvest moisture levels for last season? YES NO

If yes, enter the amount of fuel / electricity used last season _____ kWh

If yes, how many bushels of corn did you dry last year? _____ bushels

If yes, what was the average percent moisture of the corn entering the dryer last season? _____ %

Typical Harvest Data

What is the average percent moisture of the corn entering the dryer?

_____ % (use 10 year average)

What is the average percentage moisture of the corn exiting the dryer? _____ %

How many bushels of corn do you dry per year on average? _____ bushels

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Irrigation Energy Self Assessment Data Collection Form

Name of Irrigation System: _____

Step 1: System Information

Type of Irrigation System:

___ Center Pivot Sprinkler
___ Solid Set Sprinkler
___ Hand Move Sprinkler
___ Micro/ Drip Irrigation
___ Flood Irrigation
___ Linear Move Sprinkler
___ Traveling Gun
___ Side Roll / Wheel-Move System
___ Furrow Irrigation

Energy Source for Pumping (choose one)	Energy Cost per unit
___ Electricity	_____ $/kWh
___ Diesel	_____ $/gal
___ Gasoline	_____ $/gal
___ LP Gas	_____ $/gal
___ Natural Gas (1 decatherm = 10 therms)	_____ $/therm or CCF

Type of Drive Unit:

_____ Direct Drive _____ V-belt _____ Right angle gear box

Type of Pump? (Choose one)

_____ Centrifugal, self-priming, 40 psi or more
_____ Centrifugal, self-priming, less than 40 psi
_____ Centrifugal, non-self-priming, 40 psi or more
_____ Centrifugal, non-self-priming, less than 40 psi
_____ Submersible (motor attached to pump submersed in well)
_____ Vertical Shaft Turbine (pump in well with drive unit (electric motor engine) at surface)

Step 2: Pump Information

Pump output _____ gallons/minute (gsm)

Where is your pressure gage located?

At well head At distribution point to laterals At center pivot riser

System pressure at gauge _____ pounds/sq. in. (psi)

What is the total lift (vertical distance) to the well head or pump? _____ feet

What is the lift from the well head/pump to the central pivot or distribution point (if pivot is higher, positive number; lower, negative number) _____ Feet

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Average annual total amount of water applied (use 5-10 year average) _____ in/yr
Average water application per irrigation event? _____ inches/irrigation event
Application Efficiency (if known) _____%

Well and Mainline Piping Sections

	Inlet to Ground Level[6]	Well head to Point A[7]	Point A to Distribution Point[8]
Pipe diameter (in)[1,2]			
Pipe Material[3]	A S P H	A S P H	A S P H
Enter Number of Fittings			
Elbows			
Flow through Tees[4]			
Branch Tees[5]			
Swing Check Valve			
Gate Valve (open)			
Foot Valve			
Flow Meter			
Chemigation Valve			

1) Typical Pipe diameter (inches) –2, 2-1/2, 3, 3-1/2, 4, 5, 5-9/16, 6, 6-5/8, 8, 8-5/8, 10, 12
2) Pipe diameters must remain the same diameter or get smaller in progressive pipe sections for calculations to work correctly.
3) Pipe Materials – A=Aluminum, S=Steel, P=Plastic (ABS or PVC), H= Soft Hose (flexible rubber or plastic)
4) Flow Through Tees – fluid flow maintains the same direction as it enters and exits the Tee fitting.
5) Branch Tees – Fluid flow changes directions as it enters and exits the Tee fitting.
6) Inlet to Ground Level – Piping from the water inlet into the irrigation system to the ground level or pump if pump is located above ground or on the bank of a pond.
7) Point A is an arbitrary point in the piping system between the well head/pump and the Center pivot or
distribution point. This allows modeling of systems that have different pipe diameters or materials between
the well head/pump and the distribution point.
8) Distribution point – can be the center pivot riser, headland distribution pipe or the end of an open discharge pipe.

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Where to go Next

If center pivot or linear move sprinkler system – proceed to Step 3

If solid-set, hand-move, or side-roll/wheel-move sprinkler system – proceed to Step 4a

If traveling gun, furrow, flood, or drip/micro irrigation – proceed to Step 4b

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Step 3: Sprinkler Irrigation Input

What is the maximum difference in elevation from the center pivot or drive unit of a linear-move system to any point along the span? _____ feet

(Enter lower elevations as a negative number. If spans cover terrain that is higher at one point and lower at another point than the center pivot or drive unit, use the average difference.)

Lateral Span Specifications

	Span(s) A[4]	Span(s) B[4]	Span(s) C[4]	Overhang
Pipe Diameter (in)[1,2]				
Pipe Material[3]	A S P	A S P	A S P	A S P
Span Length (ft)				
Number of Spans				
Nozzle Spacing (ft)				

1) Typical Pipe diameter (inches) –2, 2-1/2, 3, 3-1/2, 4, 5, 5-9/16, 6, 6-5/8, 8, 8-5/8, 10, 12
2) Pipe diameters must remain the same diameter or get smaller in progressive pipe sections for calculations to work correctly.
3) Pipe Materials – A=Aluminum, S=Steel, P=Plastic (ABS or PVC)
4) Span(s) "A" – A, B, C are arbitrary points on the lateral where the span length, pipe diameter, pipe material, or nozzle spacing changes.

Tower drive motor HP (if electric): ½ ¾ 1 1½ 2 3 None

If electric pump is not used:

Does the engine dive have and electrical generator? YES NO

What is the electrical cost? _____ $/kWh

Degrees of rotation of center pivot : _____ (360 = full circle)

Pump efficiency (if known): _____ % (Program uses default value if unknown)

Is an end gun used? YES NO

If "YES" – What is the percentage of the rotation the end gun is on? _____%

(If pivot rotates 200 degrees and end gun is on for 100 degrees then 100/200= 50%)

End gun booster pump HP (if used) _____

(Normally used on lower pressure systems)

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Step 4a: Solid-Set/ Hand-Move/ Side-Roll Sprinkler

Number of lateral branch lines: _____

Pipe Diameter of laterals (inches)

2 2-½ 3 3-½ 4 5 5-9/16 6 8 8-5/8 10 12

Pipe Material: Steel Aluminum Plastic Soft Rubber

Average length of laterals: _____ feet

Number of sprinklers per lateral: _____

Elevation difference (distribution point to highest point): _____ feet

Pumping Efficiency (if known): _____ % (Program uses default value if unknown)

Number of acres irrigated: _____

Step 4b:Drip/ Micro, Traveling Irrigator (gun), Surface Irrigation (Flood or Furrow)

Increasing pumping efficiency is the only option for reducing energy costs for these types of irrigation systems. Travel gun systems could be replaced with sprinkler type irrigation systems to reduce energy costs.

Pumping efficiency (if known): _____ % (Program uses default value if unknown)

Number of acres irrigated: _____

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Lighting Data Collection Form

Location	Bulb Type	Number Of Fixtures	Days per Year Used	Hours per Day Used

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Lighting Summary Tables for All Buildings

Bulb Type	Number Used
Incandescent	
Tungsten-Halogen	
Compact Florescent	
T-12 Florescent Lamps	
T-8 Florescent Lamps	
T-5 Florescent Lamps	
Mercury Vapor	
Metal Halide	
Pulse Start Metal Halide	
High Pressure Sodium	
Yard Lights (Include those counted above)	

This form was developed for use with the USDA's Energy Conservation tools. Enter the data from this form at: http://www.ruralenergy.wisc.edu/conservation/lighting/default_lighting.aspx to complete the assessment.

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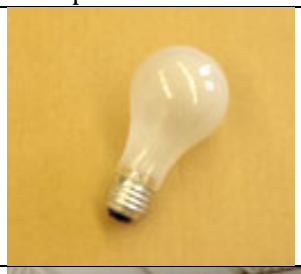
Types of Light Bulbs

Bulb Type	Example	Bulb Type	Example
Incandescent		T-8 Florescent	
Tungsten-Halogen		T-5 Florescent	
Compact Florescent		Mercury Vapor	
T-12 Florescent		Metal Hallide	
Yard Light		High Pressure Sodium	

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Potato Storage Assessment Form

Do you store potatoes for longer than 30 days? YES NO

Average cost of electricity per kWh (including fees) _____ $/kWh

Bin	Days used	HP per fan	Number of fans	Fan Motor (Standard, Premium*)	Hours fan is used/day

*The "fan motor type/efficiency" refers to whether the fan is a NEMA Premium efficiency motor or a standard efficiency motor.
NEMA Premium Efficiency motors are 3-phase motors that are 1% to 4% more efficient than required by EPAct regulations and meet the minimum requirement as specified by NEMA (National Electrical Manufacturers Association).
NEMA Premium motors will be labeled as such. Higher efficiency motors save electricity, reducing air pollution and greenhouse gas emissions from the production of electricity.

This form was developed for use with the USDA's Energy Conservation tools. Enter the data from this form at:
http://www.ruralenergy.wisc.edu/conservation/potatoes/default_potatoes.aspx to complete the assessment.

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