

Gurteen Agricultural College

Environmental and Sustainable Farming

Level 6 Certificate
In association with
Susliving

Module 8

Evaluation of Energy and Resource Usage, Efficiency &
Conservation on Farms

8.1 Evaluation of Electrical Usage on farm

Evaluation of Energy and Electrical Power on the Farm

Unit 8.1

This session aims to provide the learner with the knowledge and Skills to

- Understand what evaluation of energy and Power usage are.
- Be able to identify Farm machinery, equipment and practices and their consumption patterns .
- Develop tools and methods to be able to evaluate Electrical Energy Use on a given farm.

Energy and Power

- 2 Energy Types

Primary – (Raw State)

i.e Coal , Oil, Animal feed

Delivered- (Useful Energy)

i.e Heat, Cooling, Electricity

Power Basics

- POWER ; is the rate at which we use energy and is measured in Watts (Energy and Time)
i.e Modern Tractor ; Alot of Fuel burned quickly=
High power or racing car – 0 to 60mph in 5 sec

Go cart- small amount of fuel over the same
time = low power

Measuring Power

- There have been many ways of measuring power such as Horse Power but KW is the accepted international standard
- KW – Kilowatt is the standard measurement of power but others are
- 1 KW= 1.33 HP Horse Power
- 1KW= 8.9 CC Cubic Centimeter =
- 1KW= 3414 BTU – British Thermal unit

What do we pay for

- We pay for power used in a month in Kilowatt hours .

Our bill is the total units used for all electrical equipment, readable from - Meter box.

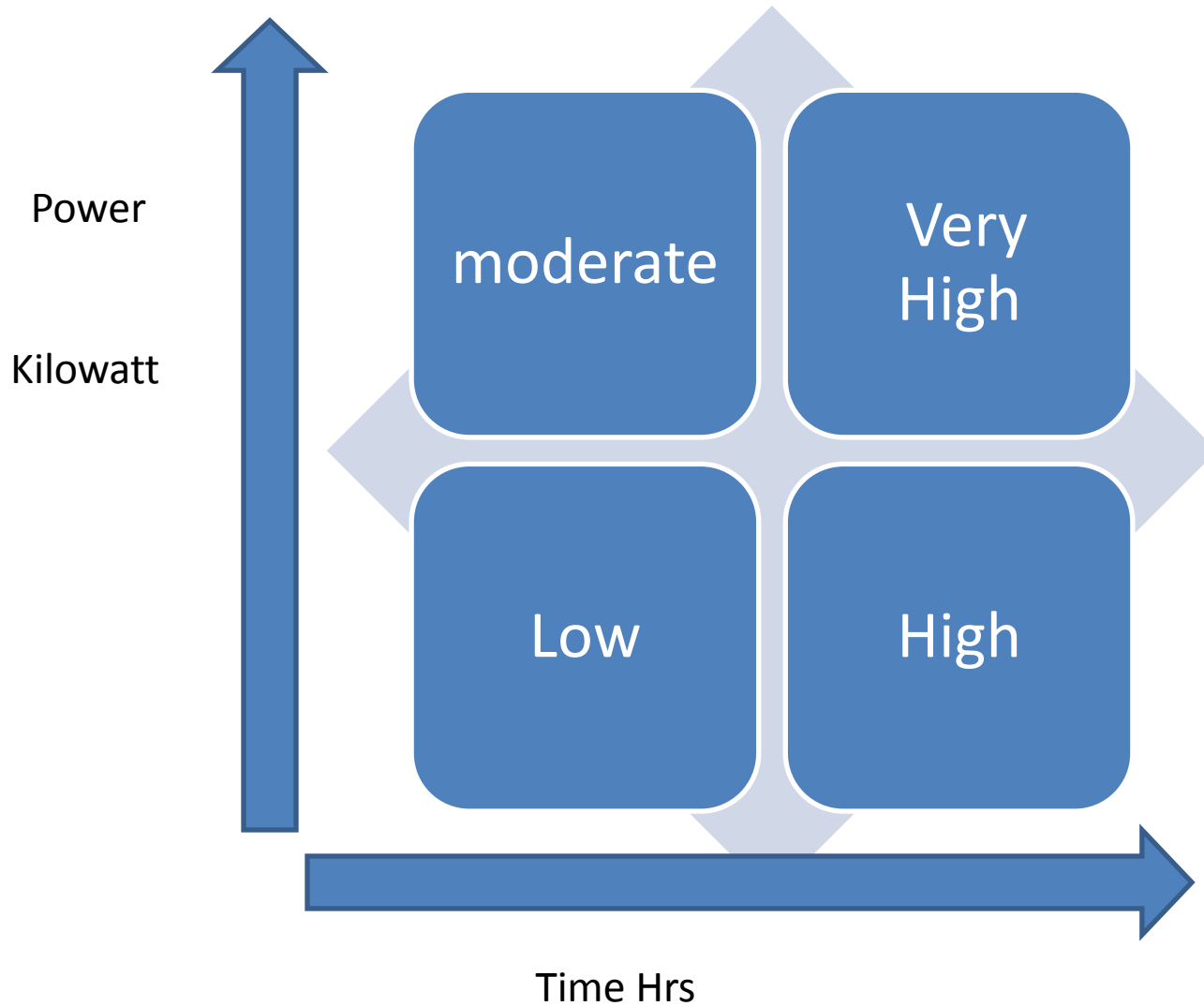
How is it calculated ; The Electrical Load (Any item consuming electricity) and the amount of running time (Hours)

=KWHRS

What Drives energy consumption and cost

- 2 drivers -
- POWER (size or rating of appliance, machine, boiler , Tractor etc Kilowatt KW)
- TIME (amount of hours the appliance , machine, Boiler, tractor runs for

Measuring Power consumption



Evaluating Power Usage

- To EVALUATE is to put a value, or figure or measure on something.

Simple Steps;

1. Identify each piece of equipment and its power rating
2. Estimate hours running per day
3. Total Number of KW/hrs per day
4. Predicted monthly KW/hr total
5. Multiply by charge from your supplier

How to reduce Electrical power consumption

- Reduce the amount of items
- Reduce the size / power of the units
- Reduce the time in use

Group activity

- In groups of 4 , use the on-line appliance calculator and search for energy rating of the following items ;
garden pond pump, fridge freezer, shower and storage heater
- In Groups of four , complete and feedback results from worksheet w8.1

Tools and methods

Automatic Tracking

1. Use standard energy monitor –real time data

Advantages ;

- Can identify and isolate individual pieces of equipment/ farm segments
- Can Identify periods of unexpected usage/ activity

Tools and methods

Manual tools ;

1. Track monthly usage and record- units and cost– source Energy provider Bills.
2. List all equipment and predict daily usage -
3. Compare actual monthly total with predicted
4. Actual usually higher than predicted –Why ?

Electrical Usage Survey

On your selected farm, find out *WHERE* the electrical energy is used?

Amount of energy used (kWh) by:

- Drystock sheds
- Milk parlour
- Workshop
- Other

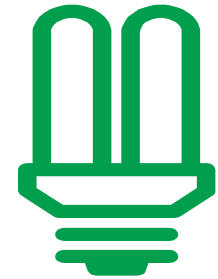


Electrical Usage Survey

On your selected farm, find out *HOW* the Electrical energy is being used:

- Type & number of lights at each location

- What equipment;
 - Heating
 - Cooling
 - Electric motors
 - Other



Electrical Usage Survey

Examples of energy usage areas to consider:

- Lights and lamps in sheds/day & night time requirements/zone lighting areas/timers/motion sensors.
- CCTV equipment
- Milking equipment
- Milk cooling and milk storage tanks
- Space and water heating, boiler units

Electrical Usage Survey

On your selected farm, find out *WHEN* is the energy being used?

How necessary is it?

- Daytime (8am-12 midnight)
- Night time (12 midnight -8am)
- Weekends (Sat-Sun)

