



# ENERGY AUDITING IN AGRICULTURE

## Introduction

Each litre of diesel consumed releases around 2.7kg of CO<sub>2</sub> into the atmosphere. Similarly, each kWh of electricity recorded on the farm meter results in 0.375kg of CO<sub>2</sub>. Savings of

10-20% can often be achieved through simple actions. By following a step-by-step approach, an energy audit can help to identify a range of CO<sub>2</sub> savings and reduce energy and fuel bills.



*Keep track of your fuel usage.*

## Quantify existing energy usage

In order to target savings, you need to know where energy is being used:

- keep records of fuel and electricity usage;
- install additional meters to provide usage data for individual buildings or pieces of equipment; and,
- match fuel use to equipment and task.

### Benchmark

Calculate usage per livestock unit, tonne of grain, hectare of land or litre of milk, and compare with industry standard figures.

### Identify savings and actions:

- involve staff – identify ‘energy champions’;
- consider working practices, as well as equipment efficiency; and,
- prioritise energy-saving options.

### Implement:

- zero- and low-cost options – can be implemented immediately; and,
- plan where investment in capital or time is required.

### Monitor

Continue to monitor usage and review progress regularly.

This practical guide highlights how to assess and optimise farm energy and fuel use.

## Top tips for every farm

A good starting point is to carry out an energy walk around:

- ask staff to help to identify where energy is being wasted;
- increase awareness of energy issues;
- identify your most likely areas for savings – see the list of typical wastage situations overleaf;
- identify repair or maintenance work that will reduce energy costs; and,
- identify where there is a need for capital investment to reduce energy costs – spend to save.

**Repeat walk around at different times of day and year.**

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## Typical energy figures

A tillage farm of 150ha uses 10,500kWh of electricity and 8,500 litres of diesel purely to dry grain even in a relatively dry year. This equates to around 27 tonnes of CO<sub>2</sub>.

A 100-cow dairy unit that uses 30,000kWh of electricity annually, results in the release of around 11 tonnes of CO<sub>2</sub>. A pig unit that uses 36kWh of electricity per pig (from farrowing through to finishing) – results in 13.5kg of CO<sub>2</sub> per pig.

For each of these enterprise types, the least-efficient farms will use up to half as much energy again. The most efficient will use 50-75% of the typical usage.



### WHERE TO LOOK FOR SAVINGS

#### Buildings:

- where buildings are heated or cooled, it is important to ensure that air leakage is kept to a minimum – drafts should be eliminated by sealing up gaps – automatic

door closers or strip curtains should be considered for frequently used openings;

- heating and refrigeration systems should be regularly serviced to maintain efficiency – setting and function of controllers should be regularly checked to prevent over heating or cooling; and,
- recirculation of air within a building should be considered to redistribute heat to where it is needed.

#### Lighting:

- compact fluorescent bulbs will use 80% less energy than conventional bulbs and should be used where lights are regularly switched on for more than a few minutes; and,
- high-intensity discharge lamps will use much less energy than incandescent lamps for lighting large areas.

## Motors, fans and pumps

Motors, especially those driving fans and pumps, often don't need to run at full speed all of the time. Fitting variable speed drives can result in substantial savings for motors that run for long hours.

#### Vehicles

Fuel performance of vehicles will be influenced by the following factors:

- tyre pressure;
- lubricant levels;
- regular maintenance;
- correct matching of tractors and equipment;
- equipment setup; and,
- driver training.



Poorly matched tractors and implements can waste energy.

#### Energy waste hot-spots

- Poorly matched tractors and implements;
- heating or cooling of poorly insulated buildings;
- badly maintained vehicles and equipment;
- incorrectly set controls for heaters and refrigeration plant;
- failure to turn off lighting, heaters, fans, etc., due to careless working practices;
- inefficient, outdated lighting;
- poorly insulated hot water tanks and service pipes;
- double handling of produce;
- over-drying of grain;
- leakage in compressed air or vacuum systems; and,
- dirty grilles, ducts and fans in ventilation systems causing unnecessary back pressure.

#### Further information

For further information please contact Barry Caslin, Teagasc, Rural Economy Development Programme at:  
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The following resource is also helpful:

- www.teagasc.ie
- www.seai.ie
- www.ipcc.ch

www.teagasc.ie/ruraldev

