



GET FARM FINANCIALLY FIT

Boosting energy efficiency on the farm

Improving the performance of buildings and systems is the first step in cutting energy costs, writes **Barry Caslin**

ENERGY costs may only represent a small percentage of turnover in farming, but reducing them can directly increase profits and competitiveness.

At a national level we need to improve our energy security by reducing our dependence on imported fossil fuels.

Energy efficiency is the first step you take to reduce your energy bills. You carry out an energy audit on your unit to identify any savings that can be made by doing things differently.

Once these savings have been made then the renewable energy options can be considered.

With farmers typically paying 15c – 16c/kWh (kilo watt hours) for electricity, displacing as much as possible either through energy efficiency or renewable generation, makes financial sense.

The displacement value will improve as the cost of energy increases.

The historic increase in energy costs has been higher than the Consumer Price Index (CPI).

High energy prices are not going to go away. Dairy farms for example have a heavy reliance on electricity, mostly for collecting and

cooling milk, heating water and lighting. This provides many energy-conservation opportunities.

A cut in energy costs ultimately results in the same bottom line benefit as an increase in sales.

Taking action

Before you embark on an all-out energy efficiency campaign you need to determine where energy is used on your farm and within the various activities of your farm business.

This will generally be achieved through an energy audit. The Sustainable Energy Authority of Ireland (SEAI) are partners with Teagasc on the Get Farm Financially Fit campaign.

SEAI have funded many on-farm energy audits and generally deal with larger groups of farmers who can make comparisons in forums such as discussion groups.

For further details on Better Energy Work Places contact SEAI on 071 915 97 30. Energy audits will quickly identify where energy is

being consumed and where the savings can be made.

The larger energy consumers who would typically pay over €15,000 per year are in a better position to justify the cost of a full professional on-farm energy audit.

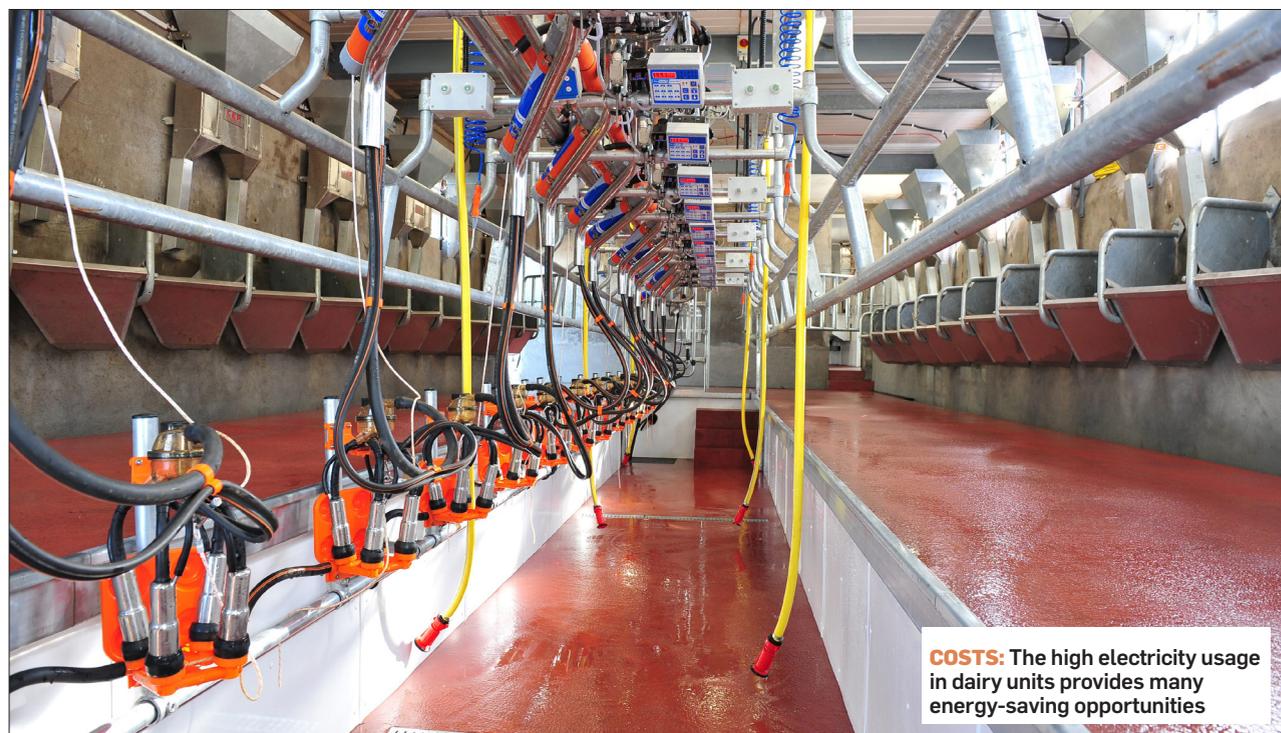
For lower energy users the audit would not go into as much detail.

Energy audits will not only identify energy efficiency measures but can also identify situations where renewable technologies such as wind turbines, heat pumps, biomass boilers and other measures can make sense.

The more information you get the easier it is to develop a strategy to give better on farm energy savings.

Energy audits are particularly relevant where expensive renewable energy projects are planned.

Barry Caslin is a Teagasc Bioenergy & RD Specialist at Oak Park Crops Research Centre, Co Carlow



COSTS: The high electricity usage in dairy units provides many energy-saving opportunities

How to cut your energy bills

Lighting, heating, including grain drying and water heating, ventilation, air circulation and cooling/refrigeration are the largest users of energy on farms. There are a number of measures which could be adopted in order to help save on energy use, including:

- **Energy Control Systems:** Make sure that all energy control systems are set properly to ensure that energy is only being consumed when required. This includes all timers and thermostats. Systems such as compensatory control or optimum start controllers can help stabilise temperatures and they are programmed to regulate heat output depending on weather conditions.

- **Lighting:** There are a range of lighting options available from fluorescent tubes, compact fluorescents, high pressure sodium, metal halide and light-emitting diodes (LED). These vary in length of life and electricity usage. LED's, fluorescent strips or sodium lamps should be fitted for best efficiency. Daylight sensors and occupancy sensors should also be considered.

- **Insulation:** Pipework and buildings should be insulated, hot water tanks lagged. This would be most necessary in farm buildings where temperatures would be critical such as pig farrowing units or poultry units.

- **Servicing:** Make sure to service boilers regularly otherwise they reduce in efficiency. Fuel savings of 10pc per year can be achieved with regular boiler servicing. Pipework, compressors and motors require regular servicing.

- **PVC Curtains:** The installation of PVC curtains or automatic self-closing doors can reduce heat losses in cold stores.

- **Monitor:** The best way of knowing where

you are losing money on energy is to monitor your electricity bills and observe what machines and systems which are the largest energy consumers on your farm. You can then monitor the effectiveness of the energy savings deployed.

- **Energy Efficient Technology:** Pre-cooling of milk in-line by well or mains water before it enters the tank has a number of advantages. A variable Speed Drive (VSD) on the vacuum pump is able to adjust the rate of air removal from the milking system by changing the speed of the vacuum pump to equal the rate of air admitted to the system.

A VSD can give savings of over €400 per annum. Pre cooling through plate meters can halve the cooling costs. Under floor heating pads in farrowing units instead of using infrared bulbs and the use of variable speed fans for ventilation will improve efficiency.

Recording Energy Usage

The majority of farmers have a good idea of how much they spend annually on both heat and electricity but very few, record accurately and monitor their on-farm energy consumption on a regular basis.

Smart Meters

These work by communicating directly with your energy supplier, so the company will always have an accurate meter reading. Smart meters can work in a variety of different ways, including using wireless mobile phone type technology to send data. An expected national rollout of smart meters will improve energy recording and farms will most likely make significant savings by using such tools.

CASE STUDY Laragan Pig Farm, Elphin, Co Roscommon



The air to heat pump system on the Laragan pig farm in Roscommon

Ger McCutcheon

LARAGAN Pig Farm in Elphin, Co Roscommon is owned and managed by Dick Togher and Ned O'Connor.

In 2011 the cost of Flogas at the pig farm was €24,744 to provide heating for 35 sow farrowing places and approximately 1,800 first stage weaner places. The farm has more farrowing places but these are heated with electric heat-pads.

The management decided to keep the Flogas system intact and use it as a back-up to the heat exchange system.

Between December 2012 and June 2015 the usage of Flogas has cost €2,270 over the period or €908, including VAT, each year.

The annual electricity usage is measured as there is a smart meter on the system. The heat pumps run on electricity.

Heat pumps provide a low temperature heat output and are therefore best suited to meeting a low heat demand such as well insulated properties with underfloor heating.

The current electricity usage is 24,711 kWh per year and if this is costed at 15.89

cent per kWh it costs €3,927, including VAT.

The cost of the heat pumps was €28,000 and re-plumbing to the central station cost €14,000 giving a total installation cost of €42,000.

The annual saving in fuel cost is €24,744 less (€908 plus €3,927) = €24,744 - €4,835 = €19,909.

The simple pay-back is the cost of €42,000 / €19,909 = 2.1 years. There were no grants or subsidies received to deliver this project. It is imperative to know your overall costs before you take any action and calculate the payback.

HEAT PUMP TECHNOLOGY

Heat pumps use similar technology to fridges to extract heat from the air, ground or water to provide space and water heating.

Heat pumps require electricity to run and the CO₂ and financial cost of this electricity needs to be taken into account.

A heat pump's coefficient of performance (CoP) is the measure of how many units of heat you get out for each unit of electricity you put in.