

Key findings

The report indicates that adoption of energy-efficiency technology had the potential to help dairy farmers cut costs by as much as 30%, a yearly saving of over £3,000 on a typical dairy farm.

Potential annual CO2 savings of nearly 13-tonnes could be made on a typical dairy farm from making efficiencies in principal areas, such as vacuum pumping, cooling, hot water heating and lighting.



Carbon footprint targets

Reducing the carbon footprint of agriculture is a challenge facing the entire industry. Both UK and EU legislation has set targets for the reduction of environmentally damaging emissions.

By 2020, the UK has to ensure that renewable energies account for 15% of primary energy usage.

The Milk Roadmap (2008) also sets clear targets for dairy farmers:

- 20–30% of producers to trial new technologies to reduce total emissions
- 15% industry-wide improvement in energy efficiency
- 30 farm businesses to pilot anaerobic digestion units

Morrisons Farming Programme

The Morrisons Farming Programme is a cross-farming industry initiative aimed at helping to build a sustainable British farming industry able to feed future generations.

At the heart of the Morrisons Farming Programme is a network of farmer groups spanning the agricultural sector, from beef to dairy to poultry. The groups act as a platform to generate ideas for applied research activity funded by Morrisons that can help build economic, environmental and social sustainability.

Some of this research work is being carried out on the Morrisons Farm at Dumfries House, a 1,000-acre beef and sheep enterprise in Ayrshire, Scotland.

For further information on this project or the wider Morrisons Farming Programme, contact:

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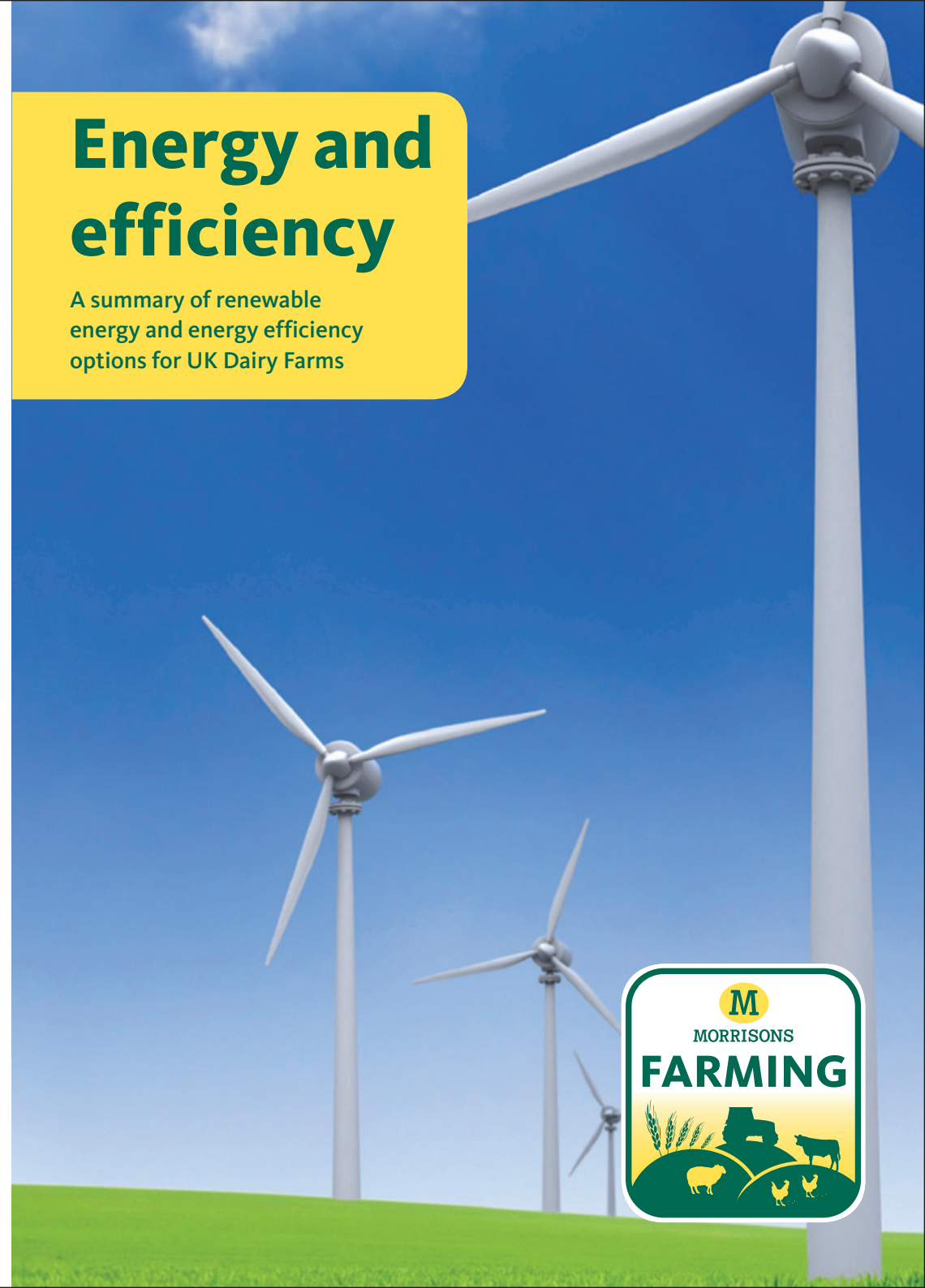
Morrisons – Closer to Farming and Food



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Energy and efficiency

A summary of renewable energy and energy efficiency options for UK Dairy Farms



Renewable energy and energy efficiency options for UK dairy farmers

The potential for greater use of renewable energy on farming enterprises to improve both economic and environmental sustainability is already well documented.

British farmers, particularly those involved in the dairy sector, are often heavy users of electricity. Not surprisingly many would like to cut these costs, adopt renewable energy and so develop an income stream as well as reducing their farm's carbon footprint.

What the report looked at

What dairy farmers wanted was an independent investigation of where they could make energy efficiencies in a typical dairy business, and what options there would be to introduce the different renewable-energy options.



Energy efficiency

Dairy businesses generally use a lot of energy in areas such as water heating or milk cooling. Most farmers believe there is scope to improve efficiency.

Areas considered in their report include:

- Vacuum pumping, including information on size, speed and maintenance of equipment
- Milk cooling, including information pre and plate systems, variable-speed pumps and unit maintenance and positioning

- Water heating, including cleaning, tuning and heat-recovery units
- Lighting, including illumination efficiency, bulb types and running times
- Water and effluent pumping, including pump and motor selection, pipe sizing and maintenance

Also considered were ventilation, compressed-air systems, parlour heating, automatic scraping systems and farmhouse energy efficiency.



What emerged from one of the dairy farmer group meetings held as part of the wider Morrisons Farming Programme was the lack of concise, impartial, farmer friendly information on the range of renewable options available that they could consider before making any investment in these technologies for their own business.

This led to Morrisons commissioning Newcastle University to produce a report to meet farmers' needs.

Renewable energy technologies

Dairy farmers wanted independent advice including likely costs on the broad range of renewable-energy options coming onto the market.

The report considered:

- Anaerobic digestion, including process and equipment, legislative requirements and digestate application to land
- Biomass heat and CHP, including process and equipment, feedstock and application, and technology development
- Wind, including process and equipment, energy source and applications, and technology development
- Solar thermal and PV, including process and equipment, energy source and application, and technology development
- Ground source heat pump, including process and equipment, energy source and application, and technology development
- Micro-hydro, including process and equipment, energy source and application, and technology development

Also considered were financial incentives, ROCs, RHI and FITs, capital support schemes, grid connection and planning permission.



Summary of potential benefits

The report gave an overall assessment of the relative attractiveness of different renewable-energy options based against other considerations, with green, yellow and red shading to indicate positive to negative levels, green being the most positive and red the least.

The table below is a smaller version of the matrix that appears in the full report.

Technology	Benefits to dairy operations	Energy output	Income/potential savings	Capital costs/kW	CO ₂ savings
AD	Green	Green	Green	Red	Green
Biomass heat	Red	Red	Red	Yellow	Green
Biomass CHP	Green	Green	Yellow	Yellow	Yellow
Wind	Yellow	Yellow	Green	Yellow	Green
Solar thermal	Red	Red	Red	Yellow	Green
Solar PV	Yellow	Yellow	Yellow	Red	Green
GSHP	Red	Red	Yellow	Yellow	Green
Micro-hydro	Yellow	Yellow	Yellow	Yellow	Green