



Alternative fuel vehicles for farms

The basics

Conventional diesel or petrol engines are not the only options available for farm vehicles and machinery. We are seeing a new generation of innovative equipment fuelled by unconventional fuels like biodiesel and electricity.

In practice

Alternative fuels have crept into use for farm machinery either as a straight swap for conventional diesel or petrol, requiring some engine modifications or perhaps completely new and innovative drive systems.

Some examples of alternative systems are:

- **Electricity**

There are now a range of electric quad ATVs (all-terrain vehicles) on the market. With no great need for substantial range or great speed, an electric quad is a viable alternative to petrol. Electric versions are about 15% to 20% more expensive to purchase, but they can provide energy cost saving of up to 90%. Some manufacturers are also now producing hybrid systems where electricity is used to drive the vehicle on the farm yard but then switches to diesel for field or road work.



ELECTRIC QUAD BIKE

Neil Nicholas, Dairy Development Centre Energy Efficiency Officer recently tested an electric powered quad bike at the manufacturer's headquarters in Ilfracombe, Devon.

The purchase price of an Eco Charger EV Eliminator 4x4 model is around £2,000 more than an equivalent petrol quad bike, but running costs are almost £1,500 per year lower, based on a medium sized dairy farm's use.

These quad bikes have a range of around 30 miles per charge with a top speed of 36 mph. They can also be charged using renewable energy meaning running costs are virtually zero.



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- **Biodiesel**

This is an alternative fuel for a diesel engine. Many existing modern engines will run on biodiesel, although in some cases there are certain requirements, including alterations to scheduled services and restrictions on operating temperatures. Manufacturers will usually state the suitability of the engine to run on biodiesel. Sometimes engines will run on 100% biodiesel, others will accept blends from 10% upwards. It very much depends on the design of the engine, its age and the manufacturers attitude towards warranty issues.

- **Liquid Petroleum Gas (LPG)**

Widely used as a road-fuel, LPG can also be used for farm machinery especially where low exhaust emissions are required – telehandlers for crop storage work for instance. Fuel cost savings are only significant when comparing against taxed road fuels. Otherwise there is no significant cost saving.

- **Biogas**

With the proliferation of biogas digesters in farming, some manufacturers have been looking at biogas for fuelling tractors. The energy constituent of biogas is methane, so engines need to be adapted appropriately. The biggest issue for farm systems is the difficulty in compressing the gas, so storage can take up a lot of space. Solutions have included duel fuel engines, but the current technology is still in its infancy.

Potential savings

Clearly, this depends largely on the chosen fuel and what other compromises have to be made – in terms of storage, power output and vehicle range. In some cases fuel cost savings can be very high – 90% or more in the case of electric quad bikes for instance – but higher capital cost and other issues might make certain choices uneconomic.

For more information on 'Alternative fuel vehicles' please contact:

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Example of a biogas fuelled tractor. Source: www.Valtra.com

