Renewable energy and farming: a winning combination

Agricultural technology is changing rapidly: farm machinery, farm buildings and production facilities are constantly being improved. This requires large amount of energy, which implies combustion of fossil fuels, release of pollutants into the atmosphere, alteration of the world's environment and increase of global warming. Therefore, renewable energy – such as solar, wind, and biofuels – can play a key role in creating a clean energy resource and an important opportunity for value-added products in agriculture. The type of renewable energy technology used in agriculture depends on the type of energy required, access to the renewable energy source and the design of agricultural facilities and processes.

Applications

Solar energy, in particular, has various applications in agriculture, supplying or supplement many farm energy requirements.

- **Solar heat collectors** can be used to dry crops and warm homes, livestock buildings and greenhouses. Commercial greenhouses usually rely on gas or oil heaters to maintain the temperatures necessary to grow plants in the colder months. On the contrary, solar greenhouses are designed to utilize solar energy both for heating and lighting. They can collect and store solar heat energy, and are insulated to retain this heat for use during the night and on cloudy days.
- **Solar water heaters** can provide hot water for dairy operations, pen cleaning and homes. As a water heating can account for as much as 25% of a typical family's energy costs and up to 40% of the energy used in a typical dairy operation, a properly-sized system could cut those costs in half.
- Modern farms raise animals in enclosed buildings, where it is necessary to carefully control temperature and replace the indoor air regularly to remove moisture, toxic gases, odours and dust. With proper planning and design, **solar air/space heaters** can be incorporated into farm buildings to preheat incoming fresh air. These systems can also be used to supplement natural ventilation levels during summer months depending on the region and weather.
- **Solar electric or photovoltaic (PV) systems** convert sun light directly into electricity, without noise or air pollution. They work any time the sun is shining, but more electricity is produced when the sunlight is more intensive and strikes the PV modules directly. These systems are often less expensive than extensive power lines, making the farm more economical and efficient. Moreover, in areas with no utility lines, PV systems are often cheaper and require less maintenance than diesel generators, wind turbines or batteries.

PV can be used to power lighting, electric fencing, small motors, aeration fans, gate-openers, automatic supplement feeders, irrigation valve switches and are also extremely well-suited for pumping water for livestock in remote pasture, where electricity from power lines is unavailable.



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1 Join the beginnigs and endings using the verbs given below.

help • used • fulfils • is • to supply • extending • reduces • can

1. Renewable energy can be ..... ☐
2. Solar energy used in agriculture can ..... ☐
3. Carbon dioxide from burning fossil fuels ..... ☐
4. Solar energy ..... ☐
5. A solar greenhouse ..... ☐
6. A suitable solar water-heating system ..... ☐
7. PV is often much less-expensive than the alternative of ..... ☐
8. Photovoltaic water pumping systems are particularly suitable for grazing operations ..... ☐

a. save money and reduce pollution.

b. be highly cost-effective.

c. water to remote pastures.

d. many farm energy requirements.

e. the need for fossil fuels for heating.

f. power lines into remote areas.

g. a significant component of greenhouse gas emissions.

h. on the farm to replace other fuels.

2 Match the following terms found in the text with their synonyms.

1. Rapidly ☐
2. Large ☐
3. Implies ☐
4. Applications ☐
5. To retain ☐
6. To replace ☐
7. Odours ☐
8. Convert ☐
9. Well-suited ☐
10. Remote ☐

a. Uses

b. Distant, faraway

c. Fitted

d. Great

e. Smells, stinks

f. Turn into

g. Quickly

h. Means

i. To maintain/preserve

j. To substitute

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