



Energy debate heats up

Improving the level of efficiency on Irish farms is a key component to ensuring their resilience as they face demanding economic and environmental challenges. **TEAGASC'S** Barry Gaslin outlines the main topics covered at the recent 'Energy in Agriculture' event.

Despite recent reductions in energy prices there is still great scope on many farms to reduce energy usage and there are opportunities for farmers to invest in renewable energy technologies, which will lower the required use of fossil fuels in Ireland. The primary objective is to improve the efficiency of systems by insulating, and by using better lighting systems and more energy-efficient technologies. This cuts the kilowatt hours (kWh) or units of energy needed. It's only then that you decide on what renewable technologies can be deployed to take the place of the fossil fuel energy-producing systems.

There has been an increasing scrutiny of greenhouse gas (GHG) emissions in recent years. Ireland has a very high dependence on the agricultural sector, with gross agricultural output (GAO) valued at €6.92 billion in 2016. The beef and dairy sectors account for 38.8% and 29.5% of this, respectively. As a consequence of this our agricultural percentage of our overall GHG emissions is relatively high compared to most other European countries. Agriculture in Ireland contributes about 33% of our national GHG emissions due to the fact that we have a high bovine component in our national output from agriculture. By improving our energy efficiency, and also investing in renewable technologies, we can reduce GHG emissions coming from the agricultural sector per unit of output. This will also enhance the green credentials of the agricultural sector and improve the marketability of Irish produce.

Energy efficiency measures

There are a number of areas where farms can undertake measures to improve their energy efficiency:

- choosing an energy supplier with the most competitive tariffs;
- energy-efficient lighting;
- insulating buildings and pipework;
- installing control systems in more intensive energy systems;
- basic maintenance, such as removing dust from the fins of chill units or from radiators; and,
- replacing old inefficient equipment such as motors or pumps, e.g., variable speed drives, etc.

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Supports for renewable technologies

The uptake of renewable energy sources requires support schemes to encourage their deployment. As technology costs decrease, so too will the level of supports available. We need a clear matching of technology costs to the supports that will be put in place. The long-awaited Renewable Heat Incentive (RHI) will bring advancements in renewable heat deployment and we are currently awaiting a consultation on the Renewable Electricity Support Scheme. These supports will radically change our approach towards energy use and technology adoption over the coming years.

Barriers to renewables

The procedures for approvals are quite long in Ireland and this adds to the cost of developing renewable projects, especially for renewable electricity. Planning and approval, together with grid connection, are notable costly delays. There are so many agencies with which renewable project developers must work to get projects off the ground that it effectively kills off most projects.

Benefits of renewables

Denmark sees renewables as a launch pad for exports. Renewable energy is an integral part of German industrial policy. This is a strategy to keep their industry competitive. Spain launched into the renewable space because it wanted to be a global player in renewable energy. The question for Ireland is: will we be dragged kicking and screaming into the renewable space, or will Ireland be centre stage and grasp this opportunity? It will cost money to achieve our national renewable targets and to encourage the deployment of renewables. We have to look at this as an opportunity and at what renewables can do for the economy as a whole.

Heating the farm with solar

Solar hot water systems would mainly be used in the high-energy agricultural sectors. A typical dairy cow would use approximately 350kWh of electricity per year, of which around 40% (140kWh) is used for heating water. The combination of both direct and diffuse sunlight that can be trapped for use is between 1,000 and 1,100kWh per square metre each year. Solar heat is a technology supported by an RHI in Britain. If such measures are included in the planned RHI scheme here, it will be attractive to dairy farmers.

Solar photovoltaic

There has been a recent frenzy about ground-mounted solar photovoltaic (PV) in farming circles over the past 18 months. This is mainly due to the anticipated supports for renewable electricity to meet our renewable targets. Solar PV can also be roof mounted and is a well-proven technology. The cost of PV has reduced by 60% over the past seven years. In order to increase the level of renewable energy production from PV, Irish farmers will require some level of support. This could be through a feed-in tariff (FIT) or contracts for different types of electricity auction support. Each kW of installed PV will give about 800kWh of electricity output.

A typical 12kW PV panel array would cost about €12,000 or €1,000 per kW. If you offset your current electrical requirement of €0.15c/kWh, which equals to about €120 per kW or €1,440 for a 12kW panel, the payback will take over eight years. While tax deductions are available, a payback in excess of eight years is not attractive and this will require some level of support to attract investment.

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Carbon footprints

Each kWh of electricity generated from a conventional power station using either coal, oil or gas emits, on average, 0.47kg of carbon dioxide to the atmosphere. A typical 12kW PV system will generate about 9,600kWh of electricity per annum, which saves about 4.5 tonnes of emissions to the atmosphere.

Conclusion

The agricultural sector is currently faced with two defining global challenges: the need to produce more food in a sustainable way to provide for an increasing global population; and, the essential need to avoid global warming approaching dangerous levels. Local agriculture can play a major role in meeting these dual challenges. This will require good government leadership. We need buy-in from the ground up into this energy transition. We have to look at the opportunities and benefits that will emerge from facilitating this, and not just focus on the costs.

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