


One of Royal Dornoch Golf Club's six new Toro Greensmaster TriFlex Hybrid 3420 riding greensmowers, featuring Toro's first all-electric cylinder drive system, in action.



All-electric power. Are we there yet?

Battery powered equipment is still far from ubiquitous. That does not mean you have little in the way of choice; bang up to date ride-on and walk behind greens mowers are two examples of really advanced thinking. But are you ready to take the all-electric challenge?

Take a look at the list price of a Jacobsen Eclipse 322 greens mower. Offered in hybrid petrol, hybrid diesel and all-electric forms, you would perhaps expect the latter battery-powered model to be the most expensive.

As it turns out, selecting the all-electric route could prove the most economic option. Even when you allow for the fact that batteries have a finite life, replacing the complete set will cost in the region of £1,000 to £1,200. This is something that you should only need to do at three years or more.

Of course that new batteries figure will buy a fair amount of petrol or diesel. But take in purchase price and day to day running costs into account, and the sums stack up very nicely for the all-electric Eclipse. So what's the battery catch? The short answer is that there isn't one. The more considered response is to accept that whilst the all-battery powered option has its plusses it is still not the right choice for everyone. But a fully battery powered Eclipse has perhaps a wider range of courses it does suit than many may initially think.

The same applies to walk behind mowers. Those who have had a chance to actually work with battery powered mowers - the Toro eFlex or Jacobsen Eclipse - typically suggest it is the quality of cut that they concentrate upon and not how the mowers are powered. Take a look at the eFlex controller. You can key in how the mower's forward speed and rate of cut are linked so you can essentially ensure a consistent clip rate across all your greens. With the Jacobsen Eclipse walk behind you simply key in the desired clip rate and the machine automatically synchronises the cylinder speed with the forward speed, again maintaining the clip rate across all greens. As we have often pointed out, there is far more to harnessing electricity to drive equipment than just power. A key component is also the accuracy that can be dialled in to drive various elements of a machine.

Growing hybrid sales will boost motor development

Increasing acceptance of hybrid drive has no doubt helped establish just how effective electric motors are at powering the cylinder reel. If there is a downside with current motor designs it is that at the moment these drive motors are relatively 'bulky'; hydraulic motors



Jacobsen has tested a solar panel that fits in place of the roof canopy of its all-electric version of its Eclipse 322 to help top up the batteries 'on the go'. Sounds simple, but there is more to keeping the six 8-volt deep cycle lead acid batteries topped up than you may think.

are still pretty big lumps too, but they have been getting smaller over the years.

With electric motors, much of the bulk is related to the need to enable the motor to deliver the right speed and torque directly to the cutting unit and to have a large enough surface area to dissipate the heat that motors generate during work. But as sales volumes of drive motors increases, the incentives to invest in developing lighter, slimmer, cooler running and more powerful units will also climb. But don't expect a sudden revolution in design. Steady evolution is the name of the game.

What will help spur motor development is increasing sales of hybrid mowers. As these models become increasingly popular and efficient, the benefits will also impact upon all-electric mowers. A modest development in motor efficiency can have a significant impact upon the running times of a battery-powered machine.

If this suggests current hybrid and battery-powered mowers are at the wrong end of the development cycle, it is not meant that way at all. John Deere suggested its 2500E hybrid greens mower could save up to 30% in fuel use when compared to its all-hydraulic

“With the ability to tackle more demanding terrain, the electric Cushman Hauler 1200X has extra ground clearance and more suspension travel. A limited slip rear diff helps traction in slippery going too”



Battery maintenance is eased by systems that make topping up the electrolyte pretty much fool proof; worth specifying if not offered as standard. Modern batteries are far more resilient too, with a well-proven history in the golf sector.



“Anyone who has operated an all-electric utility vehicle will typically suggest they prefer driving one to a CVT automatic diesel or petrol equivalent. John Deere has seen increased sales of its Electric Gator in recent years”



sibling. Jacobsen claim in excess of 40% and anecdotally have been advised by end-users that 50% is not uncommon.

In practice, such claims are always hard to verify as no two golf courses are exactly alike. But even if the fuel savings are a more modest 20% that will still have a significant impact upon operating costs. Current technology is definitely well worth a look.

Ransomes Jacobsen can point you to operators of its original Greens King E-Plex electric models made in the 1990s that are still earning their keep.

Those mowers are pretty old tech now but the fact there are a good number still at work suggests the basics that were right then will be even better now.

Those who are interested in any form of electric power may still be waiting for the next big development. But you can end up never making a decision.

As is so often the case, it is easy to ‘spend’ someone else’s money when it comes to making suggestions. An entry level walk behind greens mower is a costly purchase, so even at this level going for an all-electric version will take some careful consideration.

The only way to get a genuine insight into the benefits of battery power is to talk to those who have taken the plunge and to learn from their experiences. But arranging for a demonstration is not going to be that difficult either. If you are in the market for a greens mower, why not add an all-electric model to your demonstration list?

Why not exploit solar power?

Surf the internet, and you will see there are a few companies offering solar panels that can be bolted on the roof of a battery powered mower or utility vehicle to help top up the charge of the batteries on a sunny day. Sounds like a good idea but it is not without its pitfalls. For starters, the sun can be shy to make an appearance in the UK!

In the US, Ransomes Jacobsen has taken a look at the idea and given cautious approval to a panel that will fit its Eclipse 322. Tests, however, went beyond measuring the panels charging efficacy. The impact upon the balance and stability of the mower itself were also tested.

“There are also issues relating to how the electronics that measure battery capacity respond to a charge coming from a solar panel in work,” says Ransomes Jacobsen Director of Marketing and Product Management Richard Comely.

“Adding a charge as the mower works can ‘fool’ the electronics into suggesting there is more battery capacity than is actually the case, and so allow the mower to be worked beyond the 20% maximum discharge. This is the limit set to preserve the batteries and enhance their working life.”

Adding that these issues, along with tilt testing a panel equipped mower, has led to cautious approval of just one panel at present. But the approval comes with a caveat that suggests its use can compromise the life of the batteries; deep cycle batteries subjected to



With battery power comes more advanced control and fault-finding options. Both the Toro eFlex and Jacobsen Eclipse pedestrian mowers can be set up to operate in a certain way, a great help when you seek consistent mowing over every green.



Courses not geared up for electric mowing may look to buying a walk behind as an initial step. All you need is a charger and somewhere to plug it in. It is only when you really work with battery power that you will know if it suits your needs.



Handheld kit such as this Stihl HSA85 hedge trimmer benefit from being able to use advanced Lithium-Ion batteries. This type of battery is used in the automotive world but at present would be prohibitively expensive for a mower or utility

charge on the go may have a shortened life span.

“The key is working out the benefits of having the potential to enhance the capacity of the mower against any degradation in the life of the batteries,” says Mr Comely. “But the point is that we do look at ideas and developments and for some users replacing a roof canopy with a solar panel may be worthwhile.”

Perhaps a ‘better’ way of trapping the sun’s power is to fit solar panels to the roof of a clubhouse or workshop. Up until December 2011, there was a potential to earn £0.42 for each kWhr generated by a solar panel.

The figure has subsequently dropped through £0.27 to £0.12, the latter making the cost of installing solar panels less lucrative than it was. But even so, opting for an increasing use of battery power plus solar electricity generation is something that is worth looking into. If nothing else it is a clear demonstration of a desire to ‘go green’.