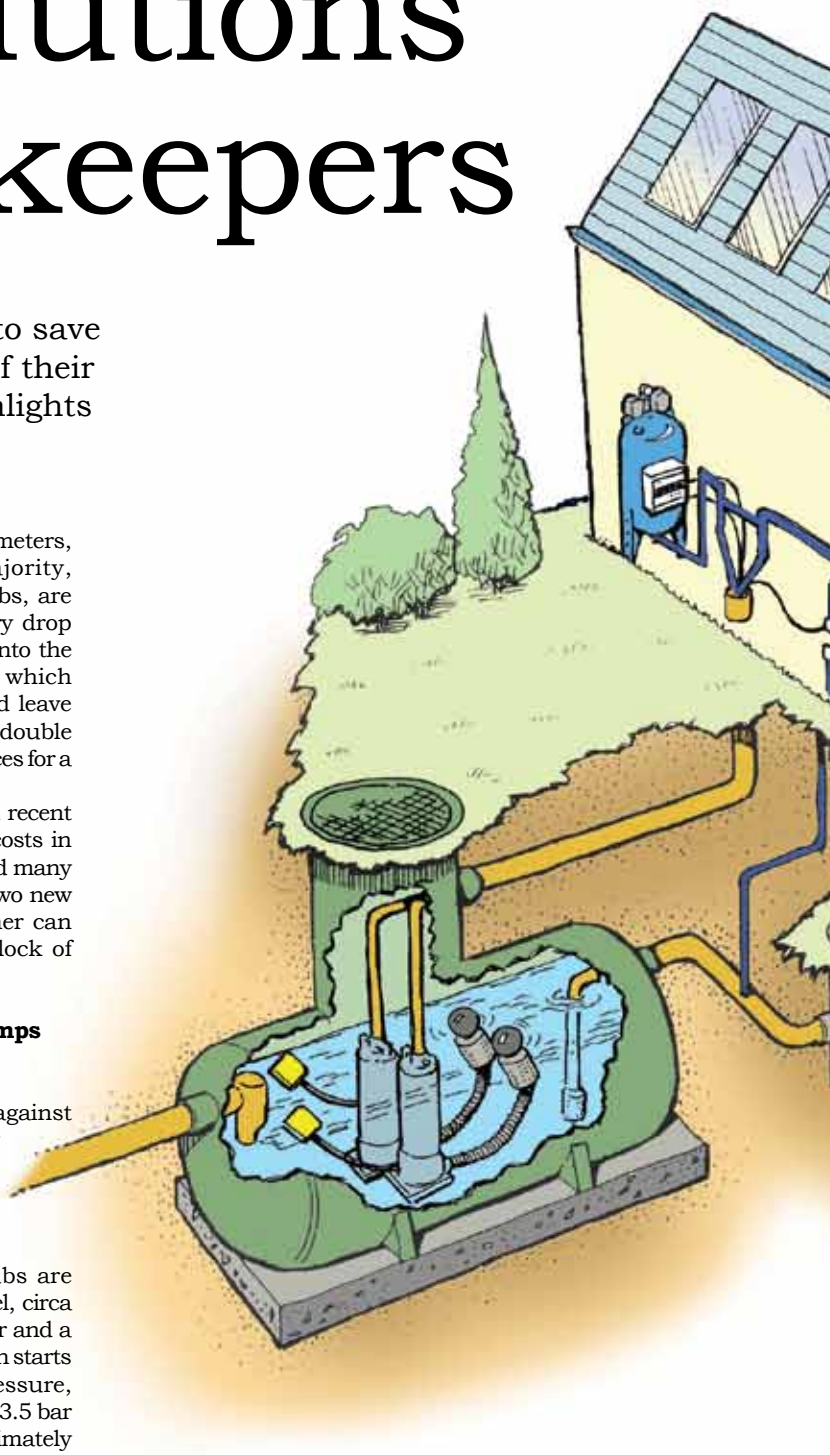
Green solutions for greenkeepers

Golf clubs are under increasing pressure to save energy and conserve water in the course of their greenkeeping operations. Paul Shute, highlights the role that new technologies can play



Golf clubs can be conservative institutions, used to implementing similar policies and using the same technologies in their greenkeeping operations year after year.

The procurement process often mirrors this conservatism. Traditionally, the Course Manager puts in a request for a new piece of equipment, such as a pump, and the Green Committee signs it off without any real discussion, due to the fact that the Committee is, naturally, made up of golfers not agronomists.

However, there are increasing signs that times are changing as a number of different pressures come to bear on golf clubs across the UK.

These pressures are interlinked, pushing clubs and greenkeepers to embrace new ways of working and forcing many to consider the issue of sustainability for the first time.

The first pressure is operational costs. As golf club memberships fall, committees are coming under increasing pressure to keep running costs down.

A major contributor to those running costs is the myriad of pumps and pipes which feed sprinkler systems alongside fairways and greens.

Each pump is electrically driven and during summer months can be in operation for many hours every day. All of this contributes to a considerable running cost, particularly when rising electricity prices are factored into the equation.

The second pressure is the threat of water bans, which after a dry summer and exceptionally dry winter has left many water companies already fearful of perilously low reservoirs and underground aquifers. What's more, commercial organisations with water meters, which are now the majority, and that includes golf clubs, are faced with paying for every drop of irrigated water poured onto the course. A dry summer, which cannot be ruled out, could leave many golf clubs with the double whammy of paying high prices for a scarce resource.

So what can be done? In recent years the rise in running costs in particular has begun to lead many golf clubs into embracing two new technologies which together can begin to turn back the clock of rising costs.

Variable Speed Drive Pumps (Hydrovar)

One way of mitigating against the rising cost of electricity is for greenkeepers to incorporate the use of various speed drives into their pumping systems.

Typically, most golf clubs are equipped with a large vessel, circa 500 litres, to keep the water and a fixed speed booster set which starts the pumps at a lower pressure, cutting in at approximately 3.5 bar and cutting out at approximately 4.5 bar. Most clubs will be equipped with up to four pumps within this type of system.

There are two key issues. Firstly, all pumps are usually 15-20% over-sized in terms of the application.

System designers will always choose the next size pump in the range to ensure there is enough capacity, but then the distributor often compounds the problem by going up a further pump size again.

The second problem with this sort of system is that the large pumps have to run flat out when the sprinkler system is turned on regardless of demand. This is clearly not energy efficient.

In particular, starting and stopping a pump consumes a lot of energy. Most pumps require five times the full load current to begin rotating. For example, a 10 amp pump will take 50 amps to get it turning.

The answer may lie in the use of variable speed drives (VSDs) which ensures that the pump never has to run faster than it needs to. Crucially, this type of equipment can now be retrofitted onto existing centrifugal pumps.

VSDs work by monitoring output

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pressure. If a golf course requires three bar pressure on a pump's output, the unit will run the pump at a speed to maintain three bar pressure and no more.

In other words, it never runs the pump faster than it needs to.

For example, a seven kW motor running at a 50 Hz cycle will use seven kW per hour of power. The same motor running at only 40 Hz will use half the kW power, namely 3.5 kW. The same pump running at 30 Hz will use only 1/7th of the power, namely one kW.

If, therefore, the pump is running at 10p per kW hour, the seven kW pump running at full speed cost is 70p per hour. The same pump running at 30 Hz will therefore only cost 10p per hour.

Crucially, variable speed controllers, such as the Hydrovar which is manufactured by Lowara, can be mounted or retrofitted to any existing pump manufacturers unit which is equipped with a standard IEC motor.

Experience suggests that the retrofit option can bring pump speed down to circa 40-42 Hz and pump users can experience savings of circa 50 per cent on their normal pump running costs.

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Rainwater harvesting

The second sustainable technology that greenkeepers can consider is rainwater harvesting. This is not a new idea, the traditional water butt has been in use to water domestic gardens for many years, but technology and water meters are increasingly bringing this idea into commercial applications and golf clubs are a key target market for manufacturers.

What's more, the time is right for golf clubs to embrace this technology. Many clubs are increasingly asking themselves the question: why irrigate with clean drinking water when we can use grey water which has been harvested and recycled to save ourselves some money?

Crucially, golf club premises provide the perfect environment for rainwater harvesting systems. Clubhouses have big roofspaces capable of collecting large amounts of rainwater as have Maintenance facilities.

With a rainwater harvesting system, rain is collected via the normal rooftop collection system which would normally then go straight into the drains. Instead, the downpipe is diverted to carry the water through a Vortex filter to get rid of any debris.

Around 95% of the water collected is then stored in a collection tank.

As water enters the collection tank it passes through a calmed inlet which calms the inlet flow of water and prevents disturbing any sediment that may build up on the bottom of the tank.

There are a number of fail-safes built into commercial rainwater harvesting systems.

When water is at minimum levels in the tank, after a period without rain, an integral probe set and transfer pump, with floating suction filter, ensures that water is only collected from the cleanest parts of the storage tank.

During periods of low rainfall, when the collection tank may become depleted in this instance the top up solenoid will be activated by float switch sensing a low level in the collection tank.

The solenoid will open and pass mains water through a type AA air gap to ensure compliance with current water regulations.

When rainwater is available again after a period of rainfall the storage tank will revert to replenishing from the collection tank.

Storage tanks for rainwater harvesting systems are available in multiple sizes from small circa 1,200 litre tanks up to 12,000 litres. However, greenkeepers should not be inhibited by standard sizes. Many systems, such as the Lowara AirRain, offer bespoke tank sizes to suit all applications.

About Xylem

Xylem (XYL) is a leading global water technology provider, enabling customers to transport, treat, test and efficiently use water in public utility, residential and commercial building services, industrial and agricultural settings.