



# Swanston Golf: Ground Source Heat, Energy Efficiency and alternative water supply

**INTRODUCTION:** When taking over the management of the course in 2006, the present management company Swanston Golf, created an additional 9 hole par 3 practice course, 7 new holes, a driving range and built a brand new clubhouse and golf academy. As part of the new development plans, energy efficiency measures and alternative energy supplies were investigated to reduce the reliance on costly mains electricity and gas.

## THE ISSUE

Energy sources such as electricity and gas are used in the golf facilities at Swanston for lighting, central heating systems, clubhouse power supplies and course management operations. Energy was a significant part of the operational costs of the golf club and prices are expected to rise dramatically over the next few years.

## THE SOLUTION

When the new clubhouse was designed, the owners were keen that the building went beyond the minimum levels of energy efficiency dictated by planning legislation and building regulations. They had a vision that not only would the clubhouse be a spacious, comfortable and inviting place for golfers, it would also serve as a meeting place for the non-golfing local community and have a high quality bar and restaurant. While in keeping with the local landscape and surroundings, the building was designed across 3 levels, built into the hillside, featuring large windows for panoramic views.

## IMPLEMENTATION

- Mains electricity and gas suppliers were compared and the best deal achieved.
- To keep energy costs down, energy efficiency measures were put in place including;
  - Roof insulation
  - Wall insulation
  - Double glazing
  - Energy efficient lighting
  - Lighting and heating controls and sensors



Lighting and heating controls

## AT A GLANCE...

>> Swanston Golf built a new clubhouse in 2006 and aimed to reduce their energy use to lower operational costs and carbon footprint.

>> Energy Efficiency measures were implemented throughout the building; including insulation, lighting and controls.

>> A Ground Source Heat Pump extracts heat energy from groundwater for underfloor heating and supplements lighting and equipment energy.

>> Overflow water supplements irrigation tanks and is used to flush toilets and in showers.



## Renewable Energy supply (ground source heat)

The club employed Invisible Heating Systems [www.ihsenergy.co.uk](http://www.ihsenergy.co.uk) based in Ullapool to install a ground source heat pump and underfloor heating system to heat the 800m<sup>2</sup> clubhouse. A borehole was drilled down 30m into an aquifer and naturally heated ground water is abstracted with a 45kW open well heat pump.

The abstracted water is approx. 8/9 degrees and is circulated through a heat exchange system to extract the heat energy. This feeds the **underfloor heating** system in the clubhouse, and supplements the lighting and other electrical requirements in the building.

Overflow water is piped to the **irrigation storage tanks** to top them up when required if the spring supply is low and it also gets pumped to a storage tank in the roof space and is used to **flush the toilets and for the showers** (potable water is not required for these).

The groundwater abstraction is licensed by the Scottish Environment Protection Agency (SEPA) under the Controlled Activities Regulations (CAR) Scotland 2011.



Discreet cover of the borehole outside the clubhouse

## IMPACTS

Compared to traditional hot water boiler energy there estimated there is up to 50 % energy saving costs in using this system. Water costs were reduced for toilet flushing and showers.

## NEXT STEPS

The club intends to investigate the possibility of reducing their mains energy usage further by installing a wind energy turbine.



Heat exchange system converting ground heated water energy into electricity



Underfloor heating system during installation

## FIND OUT MORE

If your club would like to promote an environmental success story or require support in this area, please contact Scottish Golf Environment Manager, Carolyn Hedley [c.hedley@scottishgolf.org](mailto:c.hedley@scottishgolf.org)

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