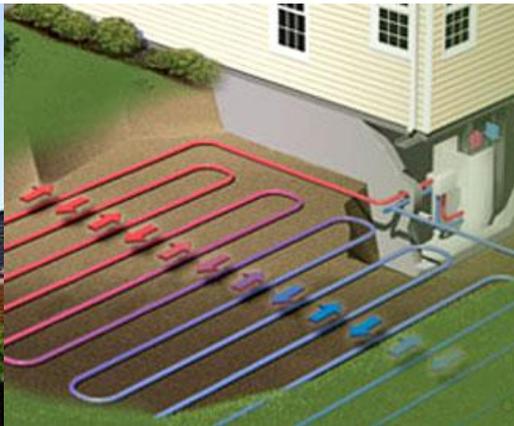




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## Recent Case Studies

Prepared for

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Nottinghamshire home dramatically reduces heating costs.

Built in 2003 this large detached house was facing ever increasing heating costs for its oil fired system. Looking for ways of reducing his dependency on this fossil fuel the owner Brian Shaw contacted Radiant for a solution. Having carried out a feasibility study a 30kW ground source heat pump was recommended to provide 100% heating and hot water.

### System design and installation

The integration into the existing heating scheme was implemented to retain the entire hot water and underfloor heating system. Without replacing the hot water tanks the heat pump is capable of providing hot water at 50C. The heat pump runs automatically with outside weather compensation controls.



The oil boiler has been retained as a backup in case of any maintenance requirements.

### Benefits

With the ever increasing costs of oil the owners now have a practical, easy to use system that they don't have to worry about.

#### KEY FACTS

#### Commissioned

October 2011

#### Scheme

Supply of hot water and heating to large family house.

#### Equipment

30kW Dimplex 3ph ground source heat pump with horizontal ground collectors.

#### Investment & Costs

The cost of installing the renewable equipment totalled £28,000.00 net. The annual fuel savings over oil are £3,347.00. This represents a payback of 8.4 years and a return on investment of 11.95%.



## Leicestershire Mill gets a new life.

When the present owner was faced with restoration costs for the old wind mill he decided to build a new home on the side of it. Not wanting to be faced with high running cost for heating and hot water he wanted a renewable energy solution. Looking at his lifestyle and the availability of land Radiant designed a fully integrated scheme to provide 100% heating and hot water and 60% of electricity.

### System design and installation

The system features a ground source heat pump, solar hot water and a wood stove boiler linked together. The heat pump will automatically shut down when the wood boiler is being used. The solar hot water also feeds into the heating system capitalising on every scrap of free energy.



To supplement the electrical requirements of the heat pump, 4kW of solar PV was put on the garage roof.



### Benefits

Predictable energy costs with virtually no maintenance.

### KEY FACTS

#### Commissioned

September 2010

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#### Scheme

Supply of electricity, hot water and heating to large family house and mill conversion.

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#### Equipment

18kW Radiant ground source heat pump, 18kW wood boiler, 3.5kW solar hot water and 4kW solar pv.

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#### Investment & Costs

The cost of installing the renewable equipment totalled £31,000.00 net. The annual running costs for heating, hot water and electricity in 2011/2012 were a mere £675.00



Northamptonshire homes get heat from the car park.

**Built in 2011 this small development of 3 homes on a former builder's yard harness energy from below the paving. This unique approach solved the problem of using ground source heat pumps with limited ground area. Rain water harvesting is also achieved within the same paving scheme.**

**Radiant Heating Solutions won a National Award for this installation.**

### System design and installation

The property is split into two apartments and one semi detached house. The primary heat sources are ground source heat pumps with integrated hot water tanks. Supplementing this is a unique solar hot water system providing both hot water and pre-heating for the heat pump. Any surplus energy from the solar is pumped into the ground collector to 're-charge' the energy store.



### Benefits

A renewable solution was easy to provide thanks to a permeable paving system.

### KEY FACTS

#### Commissioned

August 2011

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#### Scheme

Supply of hot water and heating with rain water recovery to a small development.

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#### Equipment

Each property has a 6kW ground source heat pump with permeable pavement collectors integrated with a solar hot water system.

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#### Investment & Costs

The cost of installing the renewable equipment totalled £20,000.00 net (excluding the paving). The annual fuel savings over alternative fuels are collectively £2,120.00. This is predicting a payback of 9.4 years and a return on investment of 10.6%.



Old barns take on a new lease of life.

Converted between 2011 and 2012 these old barns were turned into 3 stylish homes. Faced with the prospect of a reliance on oil or LPG the owner wanted a more cost effective solution. With little land attached to the barns the answer was a combination of air source heat pumps and wood burning boiler stoves.

### System design and installation

The property is split into a pair of two storey homes and a single story home. Each home uses an air source heat pump and wood boiler stove to feed energy into a multi function tank. This special tank acts as a hub, storing hot water for washing and lower temperature water for heating. The ground floors have underfloor heating whilst the first floors use radiators.



### Benefits

The owners have access to some timber which helps lower the overall running costs. No reliance on escalating oil and LPG costs.

#### KEY FACTS

### Commissioned

March 2012

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### Scheme

Supply of hot water and heating to barn conversions.

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### Equipment

Each property has a 9 or 12kW Air source heat pump with 10kW wood boiler stove to give an integrated heating and hot water system.

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### Investment & Costs

The cost of installing the renewable equipment totalled £20,700.00 net. The annual fuel savings over alternative fuels are collectively £1,031.00. This is predicting a payback of 9.69 years and a return on investment of 10.31% (when factoring in the offset costs of alternative equipment).



South Yorkshire mill transformed by modern technologies.

The original 18th century three-storey mill has been renovated and given a new two-storey extension. It also has a host of energy-efficient features: triple glazing; substantial wall, floor and ceiling insulation; low-energy appliances; eco lighting; an insulated lobby; and underfloor heating provided by a geothermal water source which lies under the car park.

**Radiant Heating Solutions contributed to the geothermal and underfloor aspect of this development**

### System design and installation

The Old Corn Mill is one of only a handful of carbon-negative commercial properties in the country. A combination of solar panels, wind turbines, geo thermal and water power means the building at Bullhouse Mill near Penistone, produces more green energy in a year than it consumes.



### Benefits

The exported surplus effectively removes carbon dioxide from the atmosphere, giving it an energy performance rating of A+ on its Energy Performance Certificate (similar to the A-G banding given to electrical household appliances).

#### KEY FACTS

#### Commissioned

March 2011

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#### Scheme

Part of a combined renewable development.

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#### Equipment

Radiant contributed to the 22kW ground source heat pump and the underfloor heating system.

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#### Investment & Costs

No figures at this time, however the exported surplus energy gives it an energy performance rating of A+ on its Energy Performance Certificate. Only 14 other commercial builds in the UK have this rating.



## BACKGROUND TO RADIANT HEATING SOLUTIONS

Radiant have many years of experience in the field of successfully designing, supplying and commissioning renewable technologies including heat pumps, solar pv and the associated equipment that supports it.

Our renewable energy solutions are designed to enhance the value of our customers' existing buildings and land reduce their consumption of grid energy and reduce the carbon intensity of their operations.

We have developed considerable expertise and can offer a full design service for this specialised equipment that ensures it will deliver many years of satisfaction.

### Design service

Most competent people can purchase and install a basic heat pump system. Another alternative is to employ a qualified installation engineer. However for those who want to install their own equipment there are some important calculations that must be made to prevent problems.

In order to gain the best efficiencies from a heat pump system all the components have to be matched and balanced. For Ground Source, the size of the pipe work and how it is run between the collector and heat pump are crucial for successful operation. The size of the circulation pump and the correct dosing of antifreeze all affect how the system will work.

For more advanced installations such as those integrating solar and wood stoves for full system integration we advise you to use our system design service.

For those of you who want to install the products yourselves Radiant will specify the system components and layout details. You will receive a CAD layout of the plumbing showing pipe runs and pipe sizes. An electrical CAD layout showing how to wire up the various system components. And finally a quoted bill of materials listing out all the components you require.

### Installation Service

Radiant Installations is an associated company of Radiant Heating Solutions Ltd offering a turn-key option for our customers. Specialising in renewable technologies, Radiant now offer both new and existing customers the benefits of heat pumps and solar pv. From our base in Lincolnshire we can now provide heat pump installations up to 200kW and solar pv up to 50kW.

