

# REal Alternatives

Renewable Energy Systems on the Isle of Wight

## Case Study 2

### AIR SOURCE HEAT PUMP ST. LAWRENCE VILLAGE HALL



**When seeking an affordable heating system to improve comfort in the Hall and extend its opening hours, especially in the winter months, the Management Committee decided that a Heat Pump and II radiators was the best option. Due to space constraints, it was impossible to install a ground loop for collecting heat, so an Air Source Heat Pump was fitted.**



Heat pump

Installation of the Heat Pump was completed in September 2006. It has been heating the building effectively and comes with an intelligent programmer which allows the building manager to preset the temperature for each group using the building.

*"The Heat Pump has greatly improved the building and enhanced its use in the winter months. As well as reducing our fuel bills it has increased our income from extra bookings".*

**Keith Leonard,  
St. Lawrence Village Hall Management Committee.**

### How does it work?

Heat Pumps convert low-grade heat into usable heat through compression. In the case of an Air Source Heat Pump, warmth is extracted from the air and used to evaporate a refrigerant which is circulating in the Heat Pump, causing a gas. This gas is compressed in a compressor causing heat. This heat is conveyed to the buildings heating system and distributed through a 'wet' system which can be either underfloor heating or radiators. The Heat Pump requires an electrical input, but due to its high efficiency will produce 3-5Kw of heat for each 1kW of electricity consumed. The heat is distributed.



Air intake



Radiator

### Technical details

The unit is a 10Kw Viessmann Air to Water Heat Pump. There is no regular maintenance required, apart from annually checking and oiling the fan bearings, and making sure that the pressure in the heating circuit is maintained.

Heat is distributed to the radiators at low temperature (40C) which requires radiators with a large surface area.

## Economic Analysis

<b>Heat Pump – supply &amp; installation</b>	<b>£10,311</b>
<b>Radiators – supply &amp; installation</b>	<b>£3,917</b>
<b>Total running costs – existing system (electricity)</b>	<b>£1,340 p.a.*</b>
<b>Total running costs – heat pump</b>	<b>£274 p.a.</b>
<b>Annual savings</b>	<b>£1,066 p.a.</b>
<b>Payback (at constant fuel prices)</b>	<b>9.7 years</b>
<b>CO2 emissions – existing system</b>	<b>1,467 kg</b>
<b>CO2 emissions – heat pump</b>	<b>396 kg</b>
<b>CO2 savings</b>	<b>1,071 kg p.a.</b>

\* Based on £0.10 / kWh

## Benefits

- A more comfortable environment for users of the Hall
- Reduced fuel charges
- Low maintenance costs
- Increased lettings and viability for the Village Hall
- Reduced maintenance of building fabric as condensation problems are removed
- No visual impact so suitable for sensitive landscapes

## Project Details

St. Lawrence Village Hall,  
Undercliffe Drive,  
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