

## KEEPER'S COTTAGE

100 COOMBE LANE, TAMERTON FOLIOT, PLYMOUTH, PL5 4LF

ROBERT AND SARA PLUMB



SOLAR PV, AIR SOURCE HEAT PUMP, WOOD BURNER (MULTI-FUEL), INSULATION,  
BIO-DIGESTER, ENERGY SAVING LIGHTS AND DEVICES

**Building category:** Keepers Cottage is a 1936 Grade 2 listed building, with a modern extension completed in December 2011.



Robert and Sara Plumb have always tried to live as sustainable a life-style as possible. With the opportunity offered by renovating and extending the cottage, they have tried to reduce their carbon footprint and take full advantage of their circumstances. In preparing their plans they consulted a renewable energy expert at an early stage and built in as many renewable technologies as possible.

### Energy reduction and conservation

A key objective for Robert and Sara was to incorporate as many reduction and conservation features as feasible in both the existing cottage and the extension. It took over 2 years to secure planning permission for the fully insulated extension. The cottage renovation was heavily constrained by its listing. They were not allowed to install double glazing or alter the internal or external appearance of the cottage. A glass link was built in order to reduce the impact of the extension on the cottage and a modern and simple design was adopted to achieve the counterpoint the planners required.

The energy saving technologies incorporated include:

- Cavity wall injected insulation (for which a £150 grant received from Cosy Homes)
- Loft insulation
- Draught proofing and exclusion
- Double glazing in the extension
- Underfloor heating
- Energy management tools, including thermostats and controls
- Energy saving light bulbs and efficient appliances
- Bio-digester – a Klargester 6 person capacity. Serviced annually, the digester is emptied every 2 years. There are no sewerage charges.



The bio-digester

The property also benefits from a private water supply.

### Energy generation

The delay in obtaining planning permission ended up favouring Robert and Sara in terms of the investment cost of renewables and the various incentives available (FITs and RHI).

The extension also opened up the opportunity for a PV array on the flat roof and the inclusion of underfloor heating.

#### Solar PV:

An array of 16 PV panels, with 4KW capacity, on the roof of the extension. These were installed on 01/12/11 by Andy Stevens, Plumbing Heating and Renewable Technologies Ltd.

#### Air Source Heat pump:

A Daikin Althema Outdoor Air Source Heat Pump (ASHP) was installed by Andy Stevens. This benefited from an £850 Renewable Heat Incentive (RHI) grant.

#### Biomass:

The property includes a multi fuel stove in the kitchen and extension which benefits from the plentiful supply of timber on site. In addition approx. 6 kilos of coal a month are used in the winter and about 2 kilos for the rest of the year.



Air source heat pump

### Costs and benefits

£850 RHI grant on the Air Source Heat pump  
PV installation cost approx. £13,000 with anticipated payback of 7 years based on FIT of 43.3p over 25 years

### Running costs:

It is too early to give a good indication on annual running costs. The multi-fuel stove was the only source of heating. Following the installation of radiators powered from the ASHP overall costs may rise, however the cottage is much warmer.

### Advice sought:

Energy Action 4 Devon (Energy Saving Trust in Devon) for insulation.  
Renewable energy consultants, suppliers and internet sources

### Installer:

AD Williams – main building contractor – installed insulation in extension  
Andy Stevens – plumbing and heating installations incl. ASHP and PV panels

### Problems and solutions:

Obtaining planning consent for the listed property proved challenging and required working with the planning authorities to develop acceptable solutions.

### Lessons learnt:

Plan well in advance!

### Plans for the Future:

Robert and Sara plan to install Solar Thermal panels for hot water when they can afford them.

### Contacts Details:

Robert and Sara Plumb, 100 Coombe Lane, Tamerton Foliot, Plymouth, PL5 4LF

Phone: 01752 651125

Email: robertplumb55@googlemail.com