Cheney Way, CB4 1UD

Simon and Jan Mentha – Simon says:

Our house is a semi-detached built in 1958. We bought it in 1988, and over the years the number of repairs needed was starting to build up, for example need of a new boiler, re-wiring, a dilapidated extension.

So rather than tackle these piecemeal, we decided to go for wholesale renovation and improvement.

This has involved the demolition of a single-storey extension, and its replacement with a two-storey extension and ‘upgrading’ the resulting property, incorporating various “green” features, energy efficient measures and low-maintenance attributes.

### Overview

| Age, Type: | 1958, Semi-detached |
| Wall type, Floor area: | Block cavity, 187 sq m |
| Project timescale: | Planning 1 yr, Building 2 yrs |
| Cost of measures: | not disclosed |

### Energy usage – 2 adults

| After: | 37 kWh per sq m pa electricity (projection) |
| Before: | 30 kWh per sq m pa electricity 103 kWh per sq m pa gas |

### Key features

- + principles: sustainable, low maintenance materials
- + insulation: walls, floors, roofs, loft
- + exterior walls: cavities filled, surfaces lined
- + windows: high performance double-glazed
- + underfloor heating
- + woodburner with back boiler
- + solar thermal panels, thermal store
- + condensing boiler, weather compensating controls
- - solar thermal plates, large thermal store
- + photovoltaic (PV) cells
- + mechanical ventilation heat recovery (MHVR)
- + sunpipes: toilet, landing, dining area
- + high-efficiency appliances
- + lighting: LEDs, passive infra-red motion detectors
- + water softener, dual low flush toilets
- + rainwater harvesting: for toilets, clothes, gardening

### Low Energy Measures

- Replaced gutters with powder-coated aluminium, and softwood fascias with acetylated timber.
- Double glazed windows throughout.

- Loft topped by permeable roofing felt, allowing the dropped eaves to be filled with insulation, rather than leaving a draughty air gap, plus a sealed and insulated loft hatch.

- Exterior walls, main house: Cavities insulated and lined with super insulated plasterboard. Extension walls: inner skin Fibolite blocks for high thermal efficiency, cavities filled with rockwool batts.

- Window reveals: faced with insulated board.

- Ground floors, all laid on concrete slab: main house, floor insulated; extension, insulation and underfloor heating throughout, on the ground floor embedded in gypsum screed.

- First floor: timber joists infilled with mineral wool as thermal and acoustic insulation. Base board overlaid with underfloor heating clipped to aluminium heatspreaders topped with gypsum ScreedBoard to provide thermal mass.

- We have solid wood flooring downstairs, carpeting upstairs, and rubber tiles in the utility room, all compatible with the underfloor heating.

- Mechanical ventilation heat recovery (MVHR) throughout the house; recovering 90% heat from stale air, rather than opening windows! Allied to this, we are aiming for a Design Air Permeability of 3m³/(m².hr), difficult to attain in a refit project.

- Photovoltaic (PV) cells which generated 3100kWh in the first year.
Domestic hot water and space heating (underfloor), in order of priority, is provided by a combination of:

1. woodburner with back boiler
2. solar thermal panels
3. condensing boiler with controller for fine-tuning.

Hot water is supplied by a thermal store accumulating heat from all these sources.

A large rainwater harvesting tank is sunk into the back garden. Our neighbours have agreed to let us collect the rainwater from their roof, giving a collection area of 150m². The water will be used for toilets, clothes washing and garden watering.

In addition we have a water softener to stop the thermal store from furring up, and reducing detergent usage.

We have installed LED lighting throughout – some dimmable, supplemented with sunpipes in the downstairs toilet (which otherwise would have no natural light), landing (low on natural light) and dining area. Porch and approach lights are switched by passive infra-red motion detectors.

**Professional Contacts**

**Architect:** Nicholas Ray, NRAP [www.nrap.co.uk](http://www.nrap.co.uk)

**Building Contractor:** John Doyle, 59 High Street, Dry Drayton, Cambridge, CB23 8BS

**Eco Consultant:** Peter Pope [peter.pope@cantab.net](mailto:peter.pope@cantab.net)

**Electrician:** Ian Hall [ian.hall916@ntlworld.com](mailto:ian.hall916@ntlworld.com)

**Plumber:** David Lowe [lowe.heat@totalise.co.uk](mailto:lowe.heat@totalise.co.uk)

**Structural Engineer:** John Bowstead, Peter Dann Ltd [www.peterdann.co.uk](http://www.peterdann.co.uk)

**Products**

**Exterior**

Aluminium gutters/downpipes: Alumasc powder-coated aluminium, maintenance free, avoids PVC.


**Insulation**

Main house, exterior walls: 50mm cavity-filled, lined with 70mm Thermaline Super insulated plasterboard

Extension, exterior walls: inner skin 140mm Fibolite blocks, 120mm cavity filled with rockwool

Ground floor: Celotex, 70mm & 160mm (extension)

Plasterboard: 70mm & 40mm Thermaline Super insulation.

Loft hatch: Titan MidMade Deluxe.

Roofing felt: Klöber Permo® forte [www.kloeber.biz](http://www.kloeber.biz)

Window reveals: all faced with 10mm Spacetherm “ultrathin” aerogel insulated board.

**Windows**

Double glazed: Argon-filled Rationel Aldus +22+33.2 thermofloat U=1.16Ar, aluminium clad, timber framed [www.rationel.co.uk](http://www.rationel.co.uk)

**Flooring**

Rubber: The Rubber Flooring Company [www.therubberflooringcompany.co.uk](http://www.therubberflooringcompany.co.uk)

Wooden: Junckers Dark Ash Wide Board Classic 20.5mm, ultra matt lacquer finish; underlay QuickTherm

**Heating**

MHVR: Service Vent [www.servicevent.co.uk](http://www.servicevent.co.uk)

Condensing boiler: Vaillant Ecotec plus 415 and Heatmiser network-accessible controller

Photovoltaic cells: 14 x 2.35W kWp, Powerglaz, Midsummer Energy [www.midsummerenergy.co.uk](http://www.midsummerenergy.co.uk)

Solar thermal panels: 2 x 3m² Viridian V30 Clearline - [www.viridiansolar.co.uk](http://www.viridiansolar.co.uk)

Thermal Store: 300 litre open-vented, Eco-equipped [www.eco-equipped.com](http://www.eco-equipped.com)

Woodburning stove: 5kW Dunsley Highlander, 2kW back boiler, Cut Maple [www.fireplacesetc.co.uk](http://www.fireplacesetc.co.uk) (supply/install)

Underfloor heating: Uponor

**Lighting**

Sunpipes: Monodraught 2 x 230mm and 300mm

LEDs: Halers H2 7.9W and Toshiba 8.5W E-core LED dimmable

**Ventilation:** Vent-Axia Air Sentinel Kinetic Plus

**Water**

Water softener: Atlantis 210 - [www.atlantis-uk.com](http://www.atlantis-uk.com)

Rainwater harvesting: 4500 litre tank, Kingspan gravity-fed system [www.kingspanwater.com](http://www.kingspanwater.com)