



People Exploring Low Energy Homes

Trumpington, CB2 9JR

Dave Fox:

Dave bought his house for its proximity to his allotment plots and southerly aspect. He helps to manage the allotment site and so living adjacent made a big difference. He's since become interested in low carbon living in general, with lifestyle changes and exploiting the solar energy falling on my south-facing roof. Last year he invested in a solar photovoltaic (PV) system, with the PV array being fitted around the existing solar hot water (SHW) system panels. With the benefit of hindsight, he would do much of this differently including a wood-burning stove, and actually plan the solar panel layout. There is still plenty of work to do including more insulation and rainwater harvesting.

Overview

Age, Type: Built in 1947 mid terrace.

Wall type: Cavity

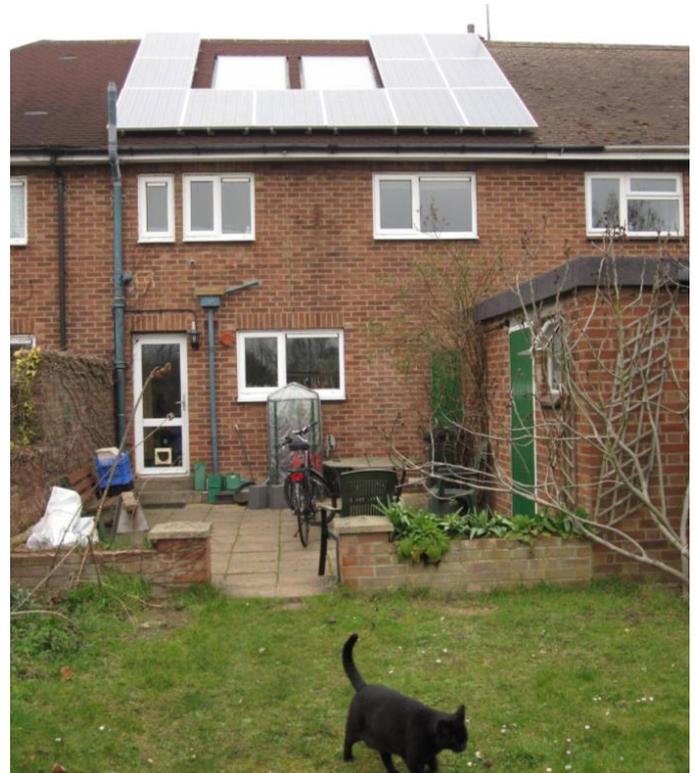
Project timescale: Originally 7 months but now on going

Cost of build: Originally £16,000.

	Energy		Carbon		1 people
	kWh/m ² /yr		kgCO ₂ /yr		
	Elec	Gas	/m ²	/person	Notes
Before	1500	7350	29	2020	
After	NA	NA	NA	NA	

Key features

- Cavity wall, loft and pipe insulation
- Double glazing
- Passive solar kitchen
- Solar thermal hot water system
- Solar photovoltaic micro generation system
- Condensing boiler
- Induction cooker
- High performance appliances
- Heating controls
- Low energy lights, LEDs
- Chimney balloon
- Curtain, draft proofing
- Water butts
- Low flow taps
- Heating controls
- Low carbon living: no car, cycle to work
- Gardening, grow your own
- Allotment



What he's learned and would recommend

Loft: He raised the joists and boarded over the insulation to make good storage space, but now wants to add more insulation. He hopes this can be done with polyisocyanurate panels which will provide a firm surface.

SHW: He chose roof integrated panels, but when he added PV these became an obstacle. He says "So if you are lucky enough to have a south facing roof, plan ahead to exploit its solar potential to the maximum in the long term, even if you only get a small system initially".

SHW: He also says that due to lack of a smart gas system controller meant he was still wasting gas when the SHW was inadequate. He's since resolved this with a controller.

PV: Dave's electricity supplier did not have a good Feed-in Tariff (FiT) reporting and payment system. He has switched to a greener company which has thought more carefully about servicing its micro-generator customers.

Food production and sharing: Lots of fruit and veg are produced from his two allotment plots and garden. Surplus is both stored for winter use and is swapped with the other allotment owners for things such as eggs, jams and chutneys and even prizewinning honey. The new allotment polytunnel and community orchard

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offer the prospect of out of season fresh produce and fruit in future years.

Renewable Energy

Cambridge City Council ran a prize draw in autumn 2007 to encourage homeowners to install SHW. I had already been thinking of installing SHW but this promotion encouraged me to get on with it. I was lucky enough to win the draw, which mostly paid for my new system. The first few weeks of living with SHW were fun: I'd wake up hoping for a sunny day, listen for the solar circuit pump, and check the data frequently. In the long term, SHW has made me more aware of hot water usage. And to some extent I can plan to use water heated by the sun rather than gas.

I was inspired to get a PV system after attending 'The Whole Home' course at the Centre for Alternative Technology. The first few weeks of operation were particularly exciting, with frequent checking of the generation meter.

I've become more aware of electricity usage, getting a usage monitor, and running appliances when the sun is shining when possible.

For both the SHW and PV I chose locally-made panels and local installers as far as possible.

Performance

At the time of writing, the PV system has generated 1500kWh in its first 9 months. This seems roughly on target to meet the predicted 2279kWh annual generation, if we have a reasonably sunny early summer. For comparison my electricity usage is historically around 3000kWh.

An energy monitor shows the real-time electricity usage in the house. This has helped me to reduce 'background consumption' a little, from 160W to 120W (ie. when I think I've turned everything off, I actually haven't). I've been recording my energy usage from bills since 2003 so I have an overview of how gas and electricity consumption – and cost - has changed over the years. Gas usage has decreased by 30% since the SHW was installed. It's too early to see what the usage impact of my PV system will be.

Future Plans

Since the last time he opened his home Dave has also bought the house next door and had added sloped ceiling insulation, underfloor insulation and a wood



burning stove as well as the usual loft and cavity wall insulation and is considering a pellet boiler. In his original home adaptation, the kitchen has now had new LED lighting and surfaces put in place and has capped off the chimney, discontinuing the use of having an open fireplace. Other than continuing to develop the property next door, there are no future changes planned.

Professional Contacts

Solar photovoltaic (PV) panels: Midsummer Energy
www.midsummerenergy.co.uk

Solar hot water system: Energise Engineering

Products and Costs

Gas heating controls: Honeywell 7 day programmer, Gasco Cambridge £100

Photovoltaic (PV) system: Powerglaz panels, MasterVolt inverter, 2.6Wp, £11,200

Solar hot water (SHW) system: 2 x 2m²Viridian roof-integrated panels, 165L hot water tank, £4000

Loft insulation: DIY, low cost.