

21st century homes  
character • comfort • low carbon

Creating an energy chic home

Here comes the  
**sun!**

Solar on your rooftop, solar for  
your community, your school,  
solar in London – and more



Ecodomus is a member or accredited by these organisations:



# WHY SOLAR AND WHY NOW ?



Ecodomus is a member or accredited by these organisations:



Who we are.....

Where we come from.....

Where we would like to think **we**  
are going.....



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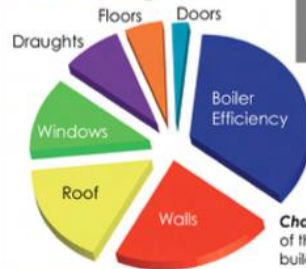


# 70% Retrofit Case Study

## Before

The building before the work took place was typical of the UK's building stock - single glazed windows with some secondary glazing, and an uninsulated roof, walls and floor. An 'antique' boiler provided hot water at vast expense as well as producing excessive Green House Gas emissions.

Our task, besides providing a much needed attic refurbishment, was to increase the thermal efficiency of the house, to reduce energy bills, and to lower its carbon footprint.



= 17,858 kWh a year  
OR  
= 5,294 kgCO<sub>2</sub> a year

Chart 1: Breakdown of the emissions per building element

## In Detail Insulation

The existing structure of the roof was little more than plasterboard, joists and tiles. By increasing the thermal resistance to above building regulations, further savings can be made. We only specify natural insulation, as we believe the embodied energy in producing materials is just as important, as is the environment in which our clients live.

An airtightness membrane reduces heat losses further to produce an efficient building envelope.

	Walls	Roof	Window	Doors	Floor
Existing U Values	2.0	1.9	5.4	3.0	0.61
Building Regulations (Part L1b 2006)	0.35	0.25	2.2	2.2	0.25
Improved Building Fabric	0.22	0.24	1.2	1.1	0.21

Table 1: improvements to the U Values of the building fabric

We believe that the requirements Building Regulations are woefully inadequate.

We aim to improve the building fabric to much higher level, saving the customer money in reduced energy bills, and lowering CO<sub>2</sub> emissions.

## Window and Doors

All the windows and doors fitted were high specification; sustainably sourced and triple glazed. The original entrance door had a U Value of above 3W/m<sup>2</sup>K; the doors installed were almost three times more insulative. Last but not least, we didn't then just cut a big hole in it for a letterbox... we installed a lockable one on the wall adjacent... the postman seems happy enough too!

To reduce the possibility of overheating, we installed external thermal shading to the south facing loft windows and doors. Predictions for the UK's temperature in the next 40 years suggest we will require less heating and more cooling in our buildings, so shading devices such as these will naturally futureproof this building against excessive cooling costs... and render our clients' loft a much more pleasant place in summer!!!

## Solar Thermal Panels

The solar panels installed will produce more than 1,500 kWh of hot water a year, which is almost 45% of the owner's requirements. It will also save nearly 500kg of CO<sub>2</sub> in reduced Gas consumption.

## Boiler

The boiler installed was an 'A' rated, 91+% efficient System Boiler, with Weather compensation to ensure it only consumes as much gas as minimally necessary to achieve internal target temperatures relative to prevailing external temperatures.

## Wood Fired Stove

A wood fired stove, with an insulated flue liner, was also installed. This will be used for ground floor space heating during the coldest times of the year. This means a reduced usage of the gas fired central heating system, and consequently lower CO<sub>2</sub> emissions.

## Internal Wall Insulation

Taking care to insulate carefully in between the floor plates, we applied 100mm of natural, breathable woodfibre insulation on the inside face of the northern external wall, and 60mm to the party wall... adding not only a nice warm blanket to the building, but also making it a quieter place!

# Alexandra Park Road, Muswell Hill



## After

To reduce the heat losses from the house, we undertook a number of different insulation and energy saving strategies. These included insulating the floors, wall and roof with natural materials, installing triple glazed windows and also adding Solar Hot Water Panels next to the dormer window. These improvements will help reduce energy bills as well as CO<sub>2</sub> emissions.

By improving the fabric of the building to above the required standards by building regulations, this house will be more efficient and as a result will be much cheaper to run, as well as less damaging to the environment.

This leads to a **predicted:**  
= 4,955 kWh a year  
or  
= 2,297 kgCO<sub>2</sub> a year



**A predicted 73% reduction in Energy Consumption and 57% reduction in CO2 emissions**



# Solar System Case Studies

## 1. Pitched roof system – Highgate,

A 3.5 kWp installation on pitched roof with clay tiles, comprising 14 hybrid Sanyo 250W modules connected to a Sunny Boy SB3000HF-30 inverter.

**Predicted annual yields**  
 - 2,876 kWh electricity  
 - Saves 1.49 tonnes CO2  
 - Income of £1483

**Lifetime carbon savings of over 37 tonnes CO2**



## 2. Pitched roof system – Barnet, London

A 2.45 kWp installation on pitched roof with clay tiles, comprising 10 REC 245W modules connected to a Sunny Boy SB2500HF inverter. REC panels have the lowest carbon footprint of all commercially available panels which was important to our client.

**Predicted annual yields**  
 - 1,682 kWh electricity  
 - Saves 0.876 tonnes CO2  
 - Income of £867

**Lifetime carbon savings of over 22 tonnes CO2**



## 3. Flat Roof system-Alexandra Park, London

A 3.75 kWp installation on single storey bungalow with a flat felted roof, comprising 15 hybrid Sanyo 250W modules connected to an Aurora PVI3600 inverter. Panels mounted in specialist low profile ballasted racks to avoid roof penetrations & minimise weight.

**Predicted annual yields**  
 - 2,465 kWh electricity  
 - Saves 1.28 tonnes CO2  
 - Income of £1271

**Lifetime carbon savings of over 32 tonnes CO2**



## 4. Pitched roof system – Golders Green, London

A 3 kWp installation on pitched roof with clay tiles, comprising 12 hybrid Sanyo 250W modules connected to a Sunny Boy SB3000TL-20 inverter.

**Predicted annual yields**  
 - 2,876 kWh electricity  
 - Saves 1.49 tonnes CO2  
 - Income of £1271

**Lifetime carbon savings of over 37 tonnes CO2**



## 5. Flat roof system Conservation area Highgate, London

A 3.06 kWp installation on 3 storey townhouse with single ply membrane roof covering, comprising 13 hybrid Sanyo 235W modules connected to an Aurora PVI 3.0 inverter. Panel mounts fixed to roof with specialist adhesive system to avoid roof penetrations.

We also prepared the necessary planning application and obtained permission for our client.

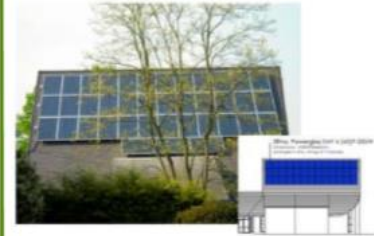
**Predicted annual yields**  
 - 2,007 kWh electricity  
 - Saves 1.05 tonnes CO2  
 - Income of £1161

**Lifetime carbon savings of over 26 tonnes CO2**

**In addition to PV modules, 4.7m2 of flat plate solar thermal collectors were installed. This is predicted to provide 64.5% of the annual household hot water by generating 1,342 kWh per annum of heat.**



## 6. Community owned pitched slate roof system - Muswell Hill, London



A 8.77 kWp installation on pitched church roof, comprising 39 Romag PowerGlaz 220W modules connected to 3x Sunny Boy SB2500 inverters.

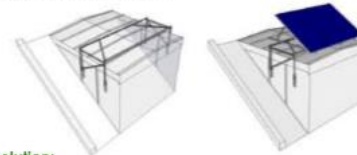
**Predicted annual yields**  
 - 7,315 kWh electricity  
 - Saves 3.85 tonnes CO2  
 - Income of £2750 per annum to be reinvested in further carbon saving measures in the community

**Lifetime carbon savings of over 96 tonnes CO2**

## 7. Going the extra mile... A bespoke tailored PV solution - Camden, London

### The Challenge:

Finding the means to install the maximum possible generating capacity onto & around a lead covered dormer roof into which our client would accept no fixings.



### The solution:

- We designed and installed a bespoke mounting frame that was fixed into the sides of the dormer structure.
- 1.68 kWp installation using Hybrid Sanyo 240W modules. 3 panels above dormer + 4 panels on lower roof area.

**Predicted annual yields**  
 - 1,410 kWh electricity  
 - Saves 0.73 tonnes CO2  
 - Income of £835

**Lifetime carbon savings of over 18 tonnes CO2**



**Ecodomus monitors all of its installations to ensure that each system performs to its maximum potential**

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By 2035 world population will be 1.7BN larger.....

using 1.5% more energy per annum.....

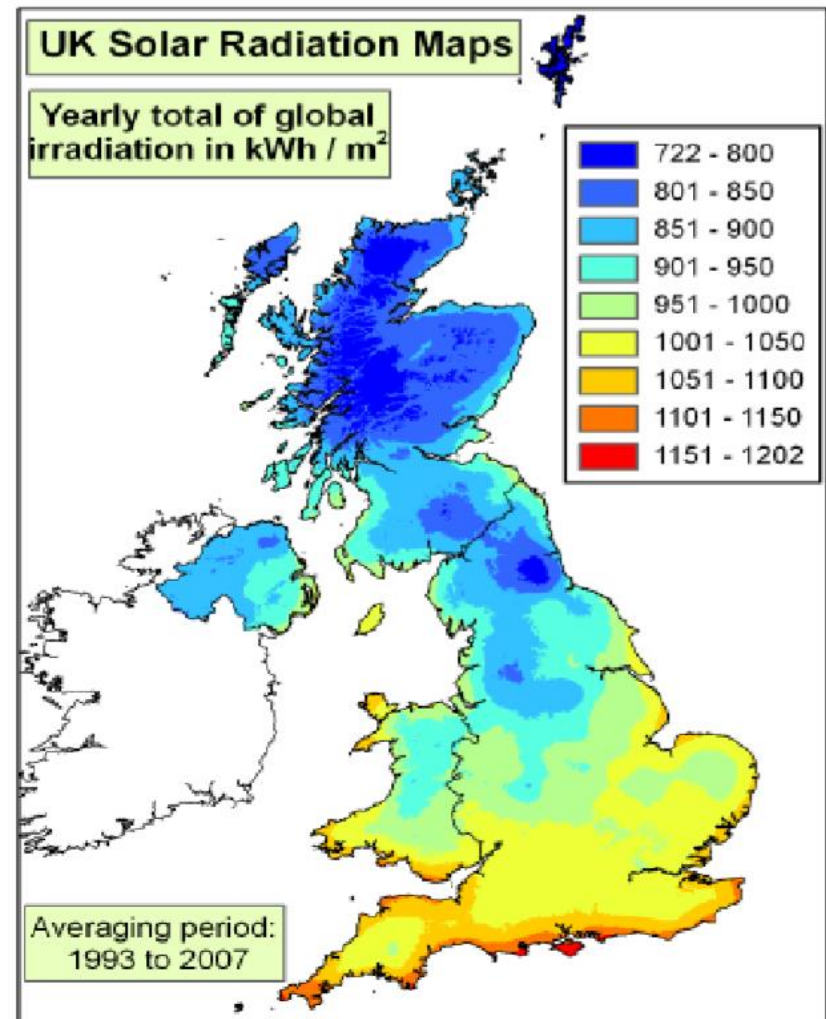
**.....adding 41% to the world's energy demands**

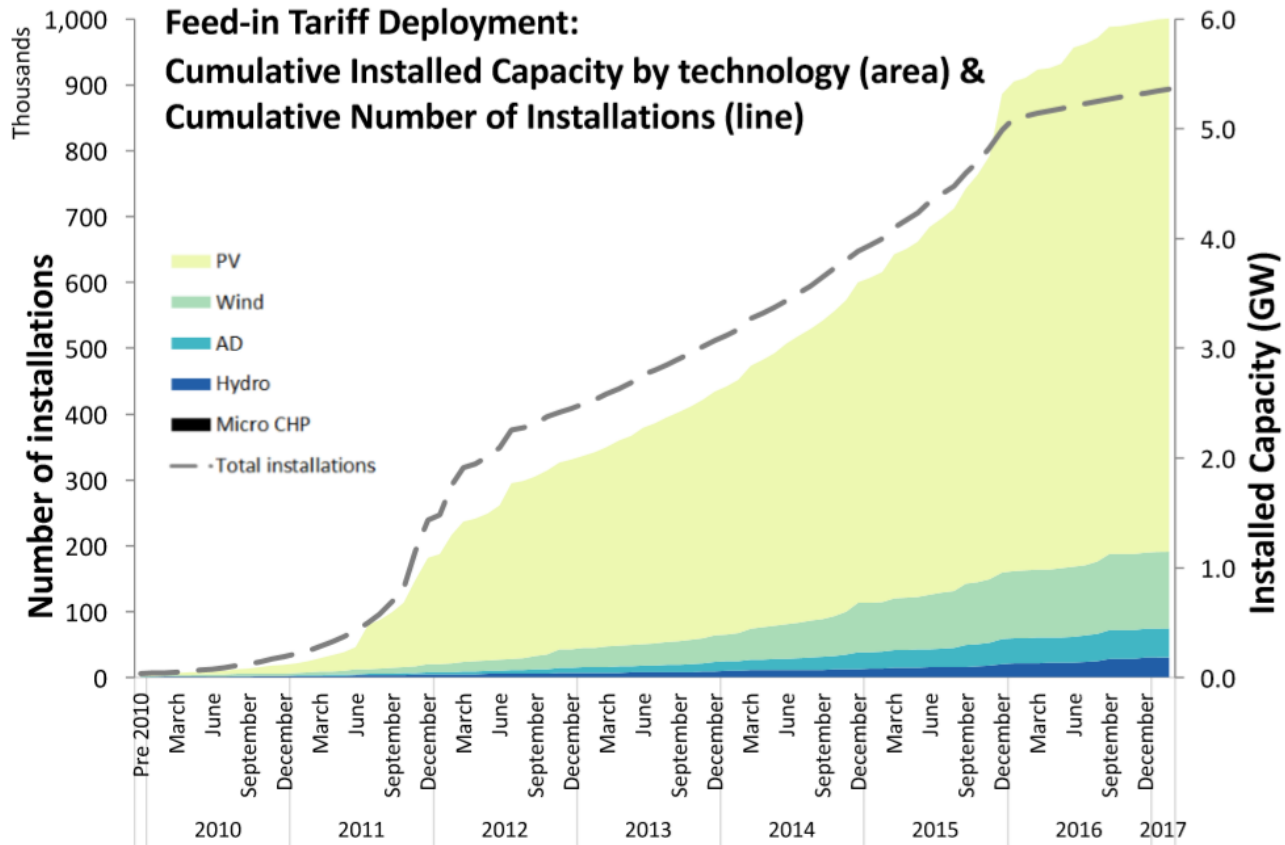


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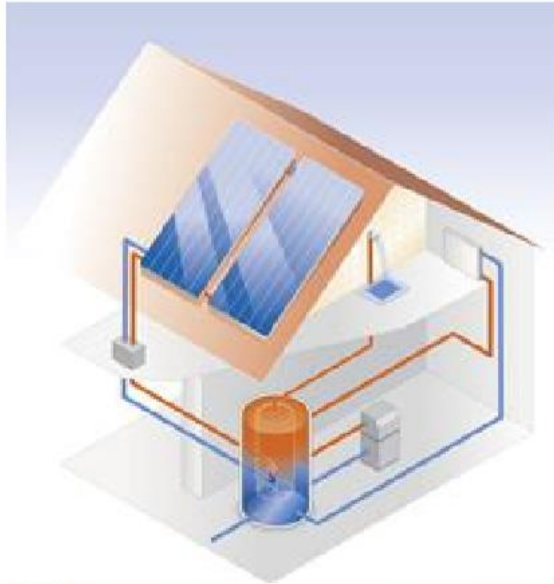


1. the right direction
2. Minimal shading
3. £1500-£2500.....a ROI of 3-5%  
.....without accounting for 2.6%  
annual energy price inflation
4. Index linked
5. Tax Free









## Renewable Heat Incentive for Solar Thermal Hot Water



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## Requirements:

- Orientation
- Minimal shading
- Conventional Boiler
- Twin coil cylinder

## Costs

- £3500-£5000 depending on cylinder and scaffolding requirements

## Incentives (RHI)

### Tariffs and payments

- Department of Energy and Climate Change (DECC)
- Current rate- 19.74p/kWh for solar thermal

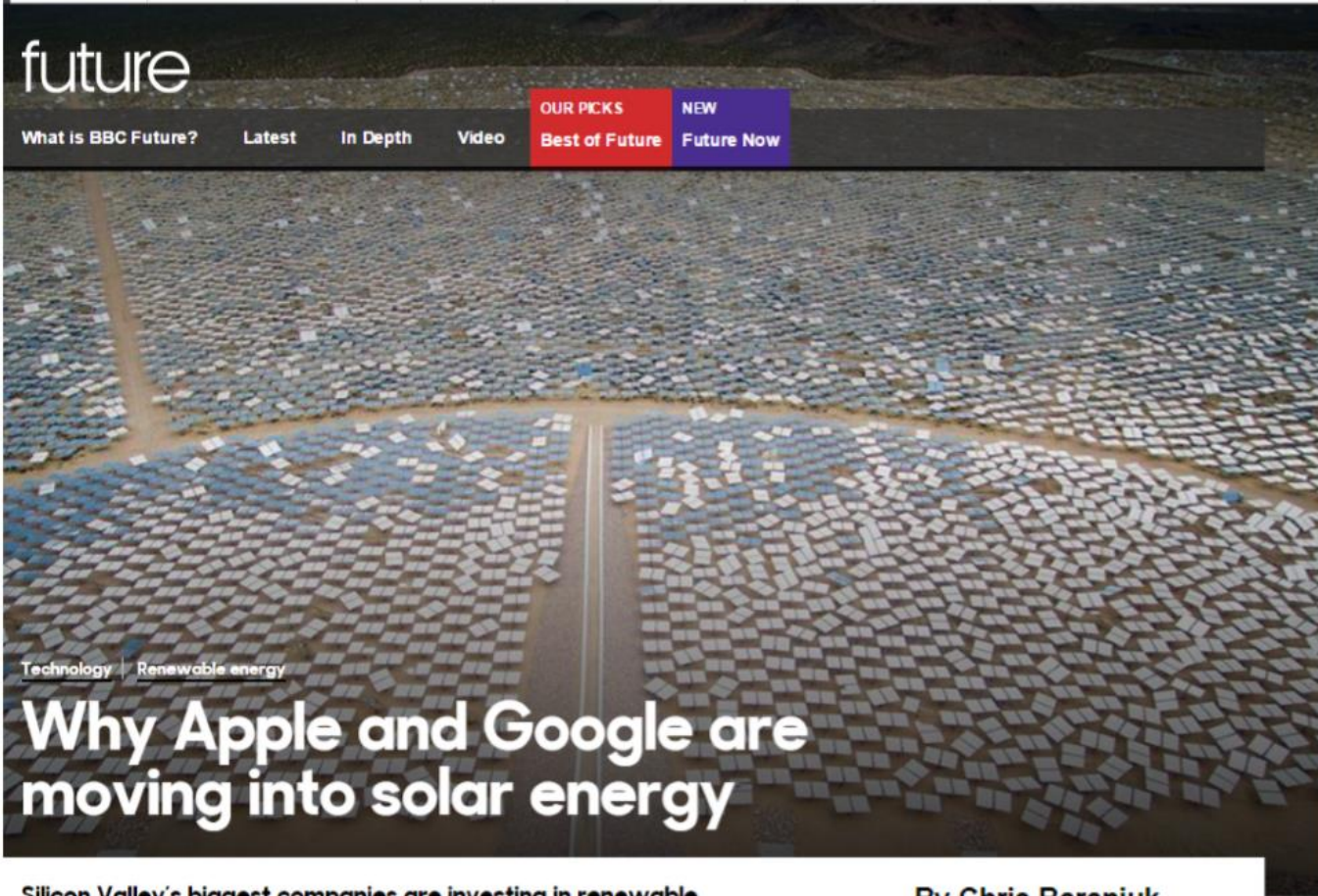
## Key aspects of the RHI

- Designed to bridge the financial gap between the cost of conventional and renewable heat systems at all scales
- Paid over 7 years...typically £200 per annum
- Metering requirements...online calculator @ofgem



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future

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Technology | Renewable energy

# Why Apple and Google are moving into solar energy

Silicon Valley's biggest companies are investing in renewable energy in a serious way - a sign, perhaps, of rapid changes in the energy market.

By Chris Baraniuk  
14 October 2016



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Saudi Arabia [+ Add to myFT](#)

## Saudi Arabia seeks \$30bn-\$50bn solar and wind energy investment

Riyadh will issue tenders for renewables programme in push to curb reliance on oil



*Solar panels in Saudi Arabia. Riyadh plans a \$30bn-\$50bn investment in renewable energy © Reuters*

JANUARY 16, 2017 by: **Simeon Kerr** in Dubai



19/04/2017

**ENERGY PRICES**



## UK households face billion pound energy bill

Recently announced price increases have ranged from 1 to 10 per cent and MoneySuperMarket said that this means that affected households will be paying £97 more a year on average



**EDF becomes latest supplier to raise energy prices**



**British Gas boss condemned for £1m pay rise**



**UK homes could see energy bills increase by up to £445 per year**



**May steals Labour policy by vowing to tackle spiraling energy prices**



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Following the installation of his first solar array in 2003, J. R. experienced an immediate return. The annual electric bill for his mountaintop home and 46-acre farm plummeted from \$37,000 to \$13 overnight.



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GEORGE W. BUSH  
PRESIDENTIAL CENTER  
\*\*\*

▪ Energy Efficiency:

- Green roof systems: 1,550 square feet in three areas, reducing cooling and heating demands
- Solar hot water system: 2,500 square feet of panels with 1,800 gallons storage capacity, supplies 100 percent of the Bush Center's domestic hot water
- Solar photovoltaic system: 19,000 square feet of panels, capable of generating 164 kilowatts or 9.5 percent of the Bush Center's energy demand
- High-performance, low-iron insulated glazing units to reduce heating and cooling loads
- High-efficiency HVAC systems to reduce energy demand
- Deep exterior overhangs to shade Bush Center building

▪ Alternate Transportation:

- Near Dallas Area Rapid Transit light rail and bus service
- Parking designated for low-emission, fuel-efficient and carpool vehicles



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"I'd put my money on the sun  
and solar energy. What a source  
of power! I hope we don't have to  
wait until oil and coal run out before  
we tackle that."

**Thomas Edison, 1931**



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