

# GreenAge Plus (+) Energy Survey Recommendations Report TheGreenAge

Property: 25 Adam Drive, Blogtown, Dasselburyshire, DD99 AAB



John Doe  
25 Adam Drive  
Blogtown  
Dasselburyshire  
DD99 AAB

4<sup>th</sup> March 2014

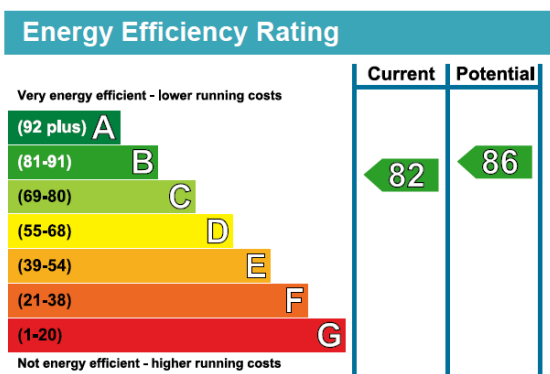
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Dear John,

Pleased to attach the final reports, and in addition we always like to go into various recommendations in a bit more detail.

### CURRENT ENERGY PERFORMANCE

In you look at the EPC you can see that your property currently has an energy rating number of 82, which puts it in band B. This is above the current UK average and is an excellent energy rating.



- More information on current performance is broken down on page 2 of the EPC report, which takes the features such as heating, lighting, walls, etc and gives it a rating out of 5 stars.
- 5 Stars is excellent whereas one or less stars is very poor. This usually gives some guidance on the parts of the property that you should focus on in the short term to increase the energy efficiency.

### RECOMMENDATIONS

#### Property Fabric

As the property was approved and constructed between 2007/08, it should have confirmed to the latest building regulations at the time, which would have factored in a high degree of insulation to all the applications, including the roof, walls, floors and windows.



#### Additional considerations

The photo here is of the loft / room-in roof space. As you can see the insulation is loosely distributed amongst the joists and measures about 150mm in depth.

A couple of simple suggestions:

1. Top-up the insulation on the floors to 300mm, by throwing over additional fibre-glass insulation (£15 a roll from B&Q);
2. Insulating the stud walls, which are to the left of the photo and show that this area is not currently insulated. This means heat is currently escaping from the heated games room and heating this space unnecessarily. The key is to retain as much heat in the adjacent games room

and not let it escape to this cold storage space.

## Heating System

Your current heating system is a Worcester Greenstar 40CDi Conventional boiler, with a Megaflo hot water cylinder. According to the Boiler database the system has an 89.2% Seasonal Efficiency and is STILL one of the most energy efficient condensing boilers on the market despite being around for a few years.



In addition the Megaflo has 60mm of internal spray foam insulation, which makes it very efficient in terms of retaining the heat.

During the visit your partner expressed the wish of analysing this current system with a heat pump, and for demonstration it is easiest to do it with an air source heat pump.

An air source heat pump as you can see here sits on the outside wall and takes in warmth from the air and compresses this to further heat the air that is then heating the wet system in your property. The compressor unit runs on electricity. Top of the range Mitsubishi Ecodan heat pump will give you a seasonal performance factor (SPF) between 2.5 and 3.5 depending on the property and other factors such as the weather and local climate conditions. This means that for every unit of electrical input a heat pump will turn 2.5 to 3.5 units into useful heat.



Your gas boiler (above) takes turns every unit of gas into 0.892 units of useful heat. So the air source heat pump is 3 to 3.5 times more efficient.

HOWEVER, looking at your energy bills provided by British Gas, a unit of gas you now pay is £0.042p/kWh and a unit of electricity is 11.62p/kWh, so gas is roughly 2.5 to 2.75 times cheaper!

If you then take then heating and hot water demand numbers from the bottom of your EPC, for a typical sized property of this size would require 25,343 kWhs of heating and hot water. Then running the numbers both on your gas boiler and a heat pump that is 2.5 times SPF would actually make the heat pump more expensive to run by about £100 a year. At 3 times SPF the heat pump is £100 cheaper to run, but the numbers are not too dissimilar.

Many companies claim the SPF to be in the region of 4 and 4.5 for an air source heat pump, which in 99% of cases is simply not true. On a modern 2013 build I have only ever seen a Mitsubishi Ecodan ever get up to 3.4 SPF on the customer commissioning documents and this is not a million miles away from a gas boiler in terms of running costs.

Then there are investment costs to consider: an air source heat pump with basic kit (unit plus new hot water tank) for the size of your property would be at least £9,000 if not more. You may have to oversize some of the radiators upstairs as the heat pumps work off a much lower flow temperatures than gas boilers. A ground source heat pump on the other hand will set you back at least £25,000.

Therefore I would suggest that if the boiler is working ok, you stick with it for the time being. Appreciate you have the Renewable Heat Incentive (RHI) that pays consumers to invest in these systems, but this is only worth it if what you have is inefficient and inadequate.

## Lighting

As discussed with your partner on the day, appreciate you are planning to move onto LED soon. I did notice a couple of examples already installed in the kitchen area, which has to be commended!

LED lighting technology has developed quite a lot over the last 2 years with further stride being made even in the last 3-6 months. Summary below of some additional tips when choosing your LED lights:

- Colour temperature: Unlike traditional incandescent and halogen bulbs that tend to produce a warm white light, LED lights are available in many different colours. This is known as the colour temperature of the bulb. To replicate the colour temperature produced from a halogen GU10, you would need to opt for a warm / daylight coloured bulb. If you prefer the cooler light often associated with office spaces, then you would probably prefer the cool light bulbs. The diagram on the right shows the different types of light available with their equivalent colour temperature.
- Lumens: Aside from the colour temperature, LED bulbs also come with varying brightness's. Gone are the days when you can compare the wattages of bulbs to distinguish, which bulb will be brighter – instead now you need to think Lumens. The reason for this is that a 50w halogen GU10 spotlight can be replaced with an equivalent 5w LED GU10 spotlight – the lower wattage is the main reason households can achieve such massive energy savings from LED bulbs – you just need to ensure that the lumens are similar between the two types of bulb to make sure you are going to get the same sort of light intensity.
- Colour Rendering (CRI): Colour Rendering is the ability for a light source to give a true reflection of the colours of the object it is illuminating. That is a bit of a mouthful, but essentially the higher the colour-rendering index the closer to daylight the bulb is (daylight portrays objects perfectly – it has a CRI of 100%). If the lights are used a lot, then you want to go for an LED bulb with a CRI of 80+, however if the bulb is just used for emergency lighting for instance it can be sub 80. The higher the CRI of the bulb, normally the more expensive it will be to buy, but if you are into painting for example, you will want to pay more to ensure the bulb has a CRI of 90+ to ensure you are getting a more accurate view of what you are painting.
- Beam Angle: The final thing to consider when buying LED bulbs is related to the beam angle. This is something that you might not have considered before, but if you are swapping from halogen spotlights over to LEDs, it's actually quite important. Halogens tend to produce a wider angled light than is suggested on the pack, so simply swapping a 35 degree angle bulb for the equivalent LED will create a very narrow angle of light. If you have a low ceiling or need an even spread of light across the room, it is really important to look for a wide 100+ degree angled LED. If you have high ceilings or need a narrower, focussed light, you should go for a lower angle beam.

Renewables

Solar PV

As discussed on the day, Solar PV is probably not a viable option at the moment as you can see from the satellite there really isn't a nice uninhibited section of the roof that is also south facing (north straight up, south facing down) that could support a decent sized solar PV system.



The roof line also splits and this obviously makes it quite difficult to mount the panels in a long array.

I also discussed with your partner on the day, about the planned upper extension, which I believe will be in the northern wing of the house, and some possibilities of mounting a solar system there. Our view is that this would also be northerly facing and it wouldn't make the solar PV system financially attractive.

Although it is now too late, but when the roofs are constructed on a property you can now install in-roof systems, such as the one demonstrated here by one of our local partners (manufactured by Bisol).



Possibly a consideration for the future on any under development projects you may undertake.

Further renewable energy considerations



While this report may be a bit disappointing in terms of demonstrating a lack of recommendations for "exciting" new technologies there are ways you can still bring this into the family through cheaper, do-it-yourself means.

For example if you think the children would get excited in seeing first-hand how electricity is generated or if you enjoy camping as a family, then you can always buy a small home solar panel kit or a self-install wind turbine as demonstrated here. They can then be connected to a battery, allowing the energy to be stored.

The stored energy in a battery can then either be used directly

with DC rated camping appliances or converted back to AC to charge your laptops, phone, etc.

## Occupier Behaviours

### Room temperature

On the day, I noted that the thermostat was set to 25°C, which is above the average of 18-22°C suggested temperature settings. According to the Energy Saving Trust, for every degree that you reduce on your thermostat can help cut heating bills by £50 per year. Since your property is larger than an average home, this effect would be much greater.

In addition since the property is quite new and the air tightness is high, then having the thermostat closer to the average setting should not make it feel any less comfortable.

### Switching energy suppliers

You are currently on the British Gas standard tariff and according to the bills that you provided you are a high energy user. By switching energy providers you can save £100s, just by a bit of shopping around. Using the government approved switching service; uSwitch is a good way to start.

### Final comment

The electricity and gas figures looked a bit inconsistent, and for the purpose of this analysis I picked up the worst case scenarios from the bills provided. Gas was roughly 40,000 kWhs and electricity was roughly 16,000 kWhs. Happy to look at this again if you don't feel these are reflective of what you have been using.

### About us

TheGreenAge Ltd offer independent energy advice to homes and businesses. For additional free and independent energy advice for homes you can call the Energy Saving Advice Service on 0300 123 1234. If you are a business please visit the Carbon Trust website: <http://www.carbontrust.com/>

If you have any further thoughts about the assessment that was carried out or if you have any questions about the Green Deal Advice Report, please don't hesitate to get in touch with the Green Deal Assessor, who has carried out the service. Details of the assessor provided the details below:

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Should the Green Deal Assessor not be available for discussion for whatever reason, i.e. an exceptional circumstance, then feel free to contact TheGreenAge Green Deal Advisory Organisation (Mon – Fri 9am to 7pm). Contact details referenced below.

Tel: 0208 144 0897

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Any of our qualified Green Deal Advisors should be able to help, interpret the Green Deal Advice Report and hopefully fully address your query.

Yours sincerely,



Nick Miles  
Commercial Director



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