



Richard Smith
 12 Main Street
 Solbourne
 Countyshire
 AB1 2CD

Our report Ref: 10400-1382972
 Date: 13 May 2010

Dear Richard,

Thank you for completing our online Energy Selector. Having reviewed your requirements, we now summarise our key findings below and provide a fuller assessment on the following pages.

Our assessment of all eligible renewable energy sources shows that using the most suitable of the 4 options below:

- You could make between £1,690 and £3,930 per annum in income and savings;
- This would add up to between £31,460 and £95,750 over the lifetime of the tariffs;
- So repay the installation cost of between £17,100 and £43,400 about twice.

Please note that the solar PV figures are for the MAXIMUM system you could install. The size of the scheme and hence its costs can be reduced approximately pro rata.

Summary of our main findings

Option	Tariffs + savings	Cost	Payback over life of tariff
Electricity generation			
solar photovoltaic	£2,680 x 25 yrs	£33,000	covers its cost more than twice
Heat production			
solar hot water	£520 x 20 yrs	£6,900	covers its cost about 1½ times
<i>Central heating alternatives - option 1</i>			
ground source	£1,250 x 23 yrs	£10,400	covers its cost more than twice
<i>Central heating alternatives - option 2</i>			
air source	£1,170 x 18 yrs	£10,200	covers its cost more than twice

Important notes:

1. All the figures in this report are estimates. We would need to visit before making a firm quotation.
2. These figures are shown before the benefits of index-linking, so the returns will typically be better than shown here.
3. These figures exclude the benefits of income tax exemption (see 'Important Information' section below), but tax-exempt figures are shown below for reference.

Next steps:

1. Log-in to your online account at www.ownergy.co.uk where you can give feedback on this report.
2. Click "respond to report".
3. Please provide as much detailed feedback as you feel able, including whether you would like to proceed to site survey.

You will then be refunded the cost of this Energy Selector Report and be asked to pay £199.75 (inc VAT) for the site survey - this payment is refunded when you proceed to installation. Please note, if you order a site survey within three weeks of receiving this Energy Selector Report, you will receive a discount to £99.50 (inc VAT).

We will contact you via e-mail to confirm the survey details.

Yours sincerely,

Neil Truphet

Operations Director

Ownergy

This is an update on your original report that we sent through to you on 2 March 2010 based on your submission to our home Energy Selector service on 1 March 2010. Our report, based on the information you originally provided, has the following sections:

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We want this report to be thorough and straightforward without burdening you with too much detail. We'd appreciate your feedback and any suggestions.

About your property

This report gives our preliminary recommendations based on the information you have provided for 12 Main Street at the grid reference (51.7051, -0.7126) you provided.

We have downloaded an aerial view of the property and this is shown below.



We understand this is a detached house with 4 reception rooms and 4 bedrooms on 2 floors. It has a large garden. You own the freehold (no mortgage).

You asked us to make recommendations about renewable electricity and heating systems and you might proceed with installing renewable energy before April 2011.

Energy efficiency

Of course we've devoted most of this report to renewable energy production, but this should be considered hand-in-hand with energy efficiency:

- If your property is not energy efficient, you will already be spending more on energy than you need to, and any renewable energy systems you now install will be bigger and more expensive than necessary.
- The Feed-in electricity tariffs provide a bonus for exporting surplus power so that's another reason to use as little power as possible yourself.
- Most energy efficiency measures have a very short pay-back period so we would advise you to make any improvements at the same time as installing the renewable energy systems we recommend in this report.

More information about energy efficiency can be obtained from the Energy Saving Trust - and there are details on our website.

We have made some specific comments below, based on the information you provided.

Renewable electricity options

Let's start by looking at the options for renewable electricity.

Owenergy are the experts on providing renewable energy systems eligible for the UK's two renewable energy tariff schemes. Full details on the Feed-In Tariffs for electricity and how they work can be found on our website at www.ownenergy.co.uk/tariffs/FIT.

Feed-In Tariffs can benefit you in three ways:

1. Payments for the renewable electricity you generate and use.
2. Payments for any surplus renewable electricity you export to the grid.
3. Electricity you generate and use yourself will save on electricity purchases.

Your major uses of electricity are: the usual lighting and general uses. You advised us that you are billed for your electricity quarterly. You have not provided any details of your bills so we have based this report on a typical average annual usage of 4,600 kilowatt hours.

The government's Feed-in Tariffs for electricity starting in April 2010 will greatly improve the cost-effectiveness of renewable generation. We have considered all the options currently listed for support under this scheme except anaerobic digestion, which is mainly relevant for use on farms.

Solar electricity

Solar photovoltaic (PV) systems need only daylight so can work in most locations.

You were interested in a solar PV array and there seems to be a suitable roof area you can use. According to data published by the European Commission, the average horizontal solar radiation in your area is about 990 kWh per square metre per year, which is plenty for a solar system in an exposed situation.

Based on the aerial view of your property, and assuming that the roof pitch is about 35 degrees, then your most suitable roof has an area of about 54 square metres (shaded red on the aerial view), which should be enough for a solar system, and faces roughly South

If you want to maximise your solar electric capacity and income, allowing for the fact that you may not be able to use all this roof area you could probably install a PV array of about 7 kW, which can deliver up to 6,010 kilowatt hours per year in an unshaded location with the forecast radiation level for your location.

The following figures are calculated on the basis that, for example, 55% of this output could be exported because it is surplus to your own requirements at the time it is generated. The remaining 45% used in the property would reduce what you buy from your electricity supplier.

Annual system output	6,010kWh per year on average
Tariff level set	36.1p per kWh if registered by March 2012
Tariff period	25 years from date of registration
Estimated total financial benefit	£2,680 per year; made up from:
Generation tariff value	£2,170 per year
Export tariff value	£100 per year
Energy purchase savings	£410 per year
Estimated capital cost	£33,025 (subject to site survey)
Estimated gross payback	£33,875 over the 25 year period
Initial assessment	Technically and financially suitable - consider

For most residential users the tariffs are free of income tax, so the combined annual value is worth £3,240 for standard rate tax payers and up to £4,950 if you pay tax at the 50% top rate. For tax-payers, the cumulative return calculated above is equivalent to 150% to 270% of the original investment, depending on your tax rate, while the fact that it is index-linked should increase it further.

Wind power

Wind turbines can be very effective both for large wind farms and at the local scale. According to a recent report from the Energy Saving Trust (see final page)[1], they need exposed locations with high wind-speeds and are not generally suitable for urban environments.

The average wind speed at a height of 10m in your area is about 4.7 metres per second (m/s), according to data published by the Department for Business, then 5.6 m/s at 25 metres hub height and 6.1 m/s at 45 metres.

You were interested in a wind turbine, but we cannot propose this option based on these wind speeds and your topography.

Hydro-power

Hydro-electric turbines use a flow of water to power the turbine.

You said you would not want a hydro turbine and we agree this looks unsuitable so we have not evaluated it further.

Energy efficiency - your electricity usage

Based on the information you have provided, perhaps you could be doing more. Unless you already have this in hand, we suggest you use the power-save mode on any computers, switch off unneeded appliances, switch off unneeded chargers, see if you have any appliances which you can put on timer switches and follow other energy saving advice on the Act on CO2 website. Furthermore, many people find that installing renewable energy makes them more conscious of energy use.

Remember: switch it off!

Renewable heat options

Your existing heating system comprises: gas boiler - consumer, hot water radiators, wood-burning stoves (or similar) plus domestic hot water system. You advised us that you are billed for your fuel quarterly. You have not provided any details of your bills so we have based this report on a typical average annual usage of 17,000 kilowatt hours.

Because your energy efficiency looks good (see below), you may find we can specify slightly smaller systems than proposed here since, as indicated above, we have used average figures.

The Renewable Heat Incentive (RHI) tariffs for heat supply do not come into force until April 2011. Though we await government's final design of the scheme, we do know the proposed tariff levels and are able to give a pretty good estimate of how it will work, because of the similarities with the Feed-in

Tariffs (FITs) for electricity.

Several heat production options will be eligible for the Renewable Heat Incentive (RHI), and we consider the main types most suitable for general use are:

1. Biomass boilers, which burn wood, pellets or wood-chip to produce heat
2. Solar thermal panels, which heat your domestic hot water system
3. Heat pumps, which extract heat from the surrounding ground, air or a water source (if available) and pump this heat into your hot water system

Solar hot water

Solar thermal systems work wherever the sun shines, so can be used by anyone with some roof space.

You were interested in a solar hot water system and there seems to be a suitable roof area you can use.

For example you could get a good contribution to your hot water from 2 typical solar panels, giving a nominal energy rating of about 3.4 kilowatts.

Solar heating can be used in addition to an existing traditional boiler system to reduce fuel bills or in conjunction with a heat pump, as described below.

A solar hot water system with a capacity of 3.4 kilowatts can deliver up to 2,320 kilowatt hours per year in an unshaded location with the forecast radiation level for your location.

You would no longer have to buy this energy from your fuel supplier.

Annual system output	2,320kWh per year on average
Tariff level proposed	18p per kWh if registered by March 2012
Tariff period	20 years from date of registration
Estimated total financial benefit	£520 per year; made up from:
Generation tariff value	£420 per year
Energy purchase savings	£100 per year
Estimated capital cost	£6,880 (subject to site survey)
Estimated gross payback	£3,559 over the 20 year period
Initial assessment	Technically and financially suitable - consider

For most residential users the tariffs are free of income tax, so the combined annual value is worth £630 for standard rate tax payers and up to £940 if you pay tax at the 50% top rate. For tax-payers, the cumulative return calculated above is equivalent to 80% to 170% of the original investment, depending on your tax rate, while the fact that it is index-linked should increase it further.

Biomass heating

Wood-fuelled and pellet boilers are pretty much like any other solid fuel boiler and connect to the household hot water and heating systems in the same way.

You said you would not want a biomass boiler, though we believe this could be a suitable option.

Ground source heat pumps

Heat pumps are rather like fridges running in reverse, in that they pump heat into a building using an external source similar to the way a fridge pumps heat out from its interior. There are three types (ground, air or water), depending on where they extract the heat from. The most common is the ground source heat pump.

Based on the aerial view of your property, there is available ground area of about 480 square metres (shaded green on the aerial view).

You were interested in a ground source heat pump and there seems to be a suitable ground area you can use.

A ground source heat pump with a capacity of 8 kilowatts can deliver up to 17,280 kilowatt hours per year with an adequate ground loop. This should meet your annual heat load, if your property is well insulated to meet the requirements of the RHI.

The figures below are based on a ground source heat pump with a standard ground loop, though other options are discussed under 'Site Requirements' below.

You would no longer have to buy this energy from your fuel supplier.

Annual system output	17,280kWh per year on average
Tariff level proposed	7p per kWh if registered by March 2012
Tariff period	23 years from date of registration
Estimated total financial benefit	£1,250 per year; made up from:
Generation tariff value	£1,210 per year
Energy purchase savings	£780 per year
Less: added electricity cost	£740 per year
Estimated capital cost	£10,392 (subject to site survey)
Estimated gross payback	£18,286 over the 23 year period
Initial assessment	Feasible and financially excellent - seek survey

For most residential users the tariffs are free of income tax, so the combined annual value is worth £1,550 for standard rate tax payers and up to £2,460 if you pay tax at the 50% top rate. For tax-payers, the cumulative return calculated above is equivalent to 240% to 440% of the original investment, depending on your tax rate, while the fact that it is index-linked should increase it further.

Air source heat pumps

Air source heating uses ambient air as the heat source, with a large relatively quiet fan to extract the heat from the air. They look rather like air-conditioning units and operate in a similar way, but in reverse - drawing heat into the building rather than extracting it. Like ground- and water-source heat pumps they are usually used to heat water to warm the house through underfloor heating or radiators.

You were interested in an air source heat pump and air-source heat pumps can be used for most buildings.

An air source heat pump with a capacity of 9.5 kilowatts can deliver up to 17,060 kilowatt hours per year under typical ambient temperatures. This should meet your annual heat load, if your property is well insulated to meet the requirements of the RHI.

You would no longer have to buy this energy from your fuel supplier.

Annual system output	17,060kWh per year on average
Tariff level proposed	7.5p per kWh if registered by March 2012
Tariff period	18 years from date of registration
Estimated total financial benefit	£1,170 per year; made up from:
Generation tariff value	£1,280 per year
Energy purchase savings	£770 per year
Less: added electricity cost	£880 per year
Estimated capital cost	£10,240 (subject to site survey)
Estimated gross payback	£10,731 over the 18 year period
Initial assessment	Technically and financially suitable - consider

For most residential users the tariffs are free of income tax, so the combined annual value is worth £1,490 for standard rate tax payers and up to £2,440 if you pay tax at the 50% top rate. For tax-payers, the cumulative return calculated above is equivalent to 160% to 330% of the original investment, depending on your tax rate, while the fact that it is index-linked should increase it further.

Energy efficiency - your heating

Based on the information you have provided, you seem to be doing well. There is really nothing more we can recommend except to ensure your house is generally airtight. Furthermore, many people find that installing renewable energy makes them more conscious of energy use.

Combined heat and power

CHP systems, which provide electricity and heat, will also be an excellent option in many cases.

At present there is only limited equipment available for household applications, but this option may well be worth reconsidering in the future.

The site requirements of the options we have suggested

Before deciding which of these options you might pursue further, we set out now some details of the factors you will need to consider:

Roof-top systems

Solar systems should ideally be angled at between 25° and 60° to the horizontal, generally directed towards the South, though they will work anywhere in the southerly arc between East and West. In some cases, horizontal or vertical systems will also work well.

You want a location that is predominantly unshaded during the day. Rooftops are very often suitable, but consider other possibilities like car-ports, garden structure, conservatories etc.

Space required for PV panels	The system above would need about 51 square metres
Space required for SHW panels	The system above would need about 5 square metres

You may choose to select one or other of the solar systems or reduce them in size. Solar system sizes can be adjusted within limits both upwards and downwards and the financial implications would change approximately pro-rata.

Ground and storage area

A heat pump is about the size of a large upright fridge.

It is worth having a large hot water cylinder or 'heat store' to get the most out of your renewable heating and solar thermal systems need cylinders with an extra heat exchange coil.

Controllers and inverters for PV and SHW systems are normally quite compact and can generally be wall-mounted, perhaps near the consumer unit in the house, or in a garage.

Ground source heat pumps need pipes (the 'ground loop') buried in the ground. They can use horizontal coils buried to a depth of 1.5 to 2 metres.

Space required horizontal ground loop	The system shown above would need about 480 square metres
Indicative space for boreholes	Vertical boreholes would need at least 50 square metres

Boreholes are vertical so use less ground area. The total length you would require might be 240 metres, which would require at least 2 holes to be sunk no less than 5 metres apart. You would need suitable area not far from the house where they can be drilled. The cost would be about £2,200 higher than using standard ground loops. The figures we stated earlier in the report relate to standard ground loops.

Access to water, wind and air

Please let us know if there is a nearby water source that might be used for hydro-power or water-source heat pumps.

Air source heat pumps need an outside location of 2-4 square metres, on the ground close to the house or a balcony where there is a good air flow.

Wind speeds can vary substantially within short distances, so any estimates for your site are only approximate. If you want to evaluate your potential for a wind turbine more thoroughly before coming to a decision, you can hire an anemometer system from us to record actual on-site data over a few months or ideally a year.

Planning requirements

Most solar systems are allowed under 'permitted development' so don't need planning permission, unless on listed buildings or in conservation areas.

Planning permission is currently likely to be required for the air source heat pump, though hopefully they will be given 'permitted development' status within the next few months.

Important information about the estimates in this report

Our company is here to help you access the Feed-in Tariffs (FITs) and the Renewable Heat Incentive (RHI), when they come into force in April 2010 and April 2011. The government has published the final design of the FITs and initial proposals on the RHI and you can keep up-to-date with progress on the websites shown below.

It has also confirmed that renewable energy systems installed after 15 July 2009 will be eligible to qualify for these tariffs, provided that they have been installed by an MCS accredited installer.

As explained above, the tariff levels for the RHI are only proposals at this stage. The numbers may therefore change when the government publishes its final figures, probably in the autumn of 2010. Some of the other information provided in this report may also change.

The system capacities and performances we give in this report have been calculated based on the property location and details you have provided. We have looked this up on maps, as accurately as we can, and used data from the locality using the information sources listed on the last page. However to ensure that the information is accurate a visit will be needed to confirm the proposals.

Until then you should assume a potential $\pm 15\%$ margin of error in any of the figures given in this report, which are offered 'errors and omissions excepted'.

Tax and index-linking

The government has confirmed that the tariff income is exempt from income tax for private individual installing systems mainly for their own residential use. Some indications of the value of this benefit are given in the calculations above, by equating these incomes back to the pre-tax equivalent.

The tariff levels will also be index-linked to the Retail Price Index, so your income would be expected to rise over time. We have not included this in our calculations, so the value of your tariff income should be even higher than we have shown here.

What to do next

We hope this report gives enough information for you to evaluate the possibilities. A list of information sources follows on the next page.

Please respond to tell us:

- If this report gives what you need.
- Any mistakes we may have made about your situation.
- Whether you now want to take this further, and if so when.

To make this as quick and easy as possible, there is a simple online form, which can also be accessed from the website page listed under 'our process' below. You should find it very quick - it's

much shorter than the form you first completed.

If you want to proceed, Step 2 is to get an on-site survey of your property and requirements. We hope you'll decide to move on to this more detailed assessment and are offering a concessionary price of £199.75 (inc VAT). This charge is refundable against the cost of a system if you decide to proceed. Please note, if you order a site survey within three weeks of receiving this Energy Selector Report, you will receive a discount to £99.50 (inc VAT).

We very much look forward to hearing from you.

Yours sincerely,

Neil Truphet

Operations Director

Ownenergy

Where to get more information

See the information we have used and keep up-to-date with these online sources:

Feed-in Tariffs	www.FITariffs.co.uk
Tariff levels	www.FITariffs.co.uk/Technologies.html
Latest changes	www.FITariffs.co.uk/Subpages/Final.html
Renewable Heat Incentive	www.RHIncentive.co.uk
Tariff levels	www.rhincenive.co.uk/Technologies.html
Latest changes	www.rhincenive.co.uk/Subpages/Consultation.html
Our website	www.Ownergy.co.uk
Technologies	www.Ownergy.co.uk/energy
Our process	www.Ownergy.co.uk/do/residential
Energy Saving Trust	www.energysavingtrust.org.uk/
Energy efficiency	www.energysavingtrust.org.uk/What-can-I-do-today
Home generation	www.energysavingtrust.org.uk/Generate-your-own-energy
Wind power report	www.energysavingtrust.org.uk/corporate/Global-Data/Publications/Location-location-location-The-Energy-Saving-Trust-s-field-trial-report-on-domestic-wind-turbines
Act on CO2	actonco2.direct.gov.uk/actonco2/home.html
Wind calculators:	
Carbon Trust	www.carbontrust.co.uk/windpowerestimator/
Department for Business	www.berr.gov.uk/energy/sources/renewables/explained/wind/windspeed-database/page27708.html

You should be able to access these sources by holding the Ctrl key and clicking on the hyperlink in the table above.