

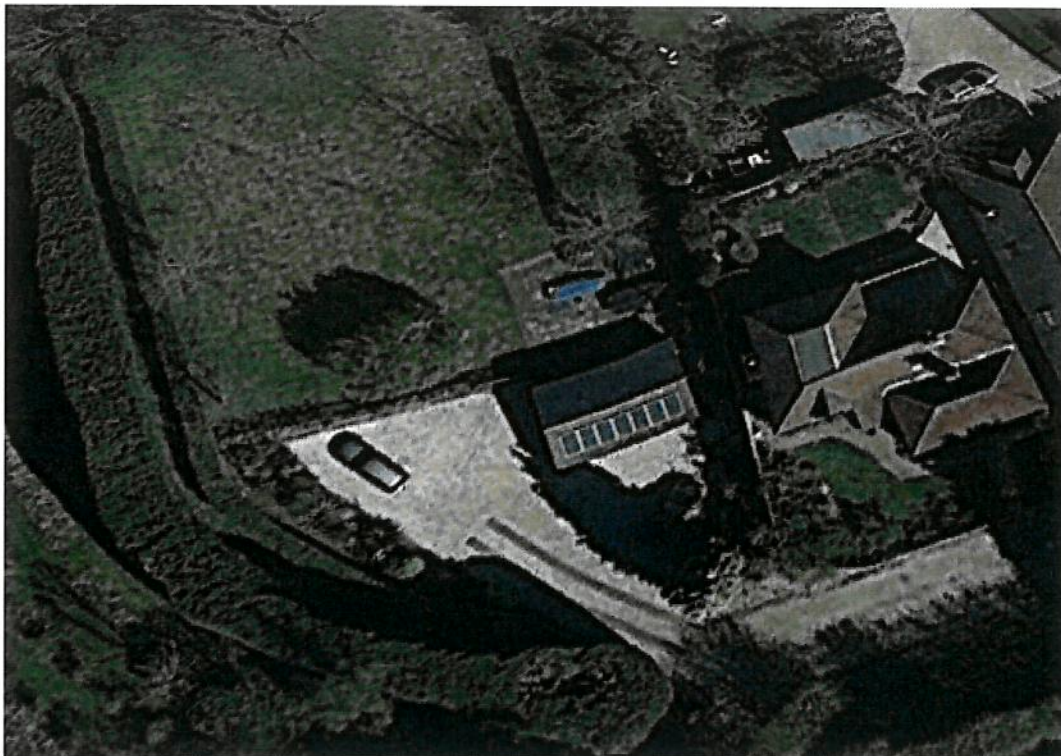
Proposal: **Air Source Heat Pump installation**

Prepared for: Mr. & Mrs. Michael Camps

Prepared by: David Nelson

Date: 7th June 2019

Client Ref: Air Source Heat Pump installation – Barnham Court Lodge



FAO: Mr. & Mrs Camps
Barnham Court Lodge
Church Lane,
Barnham,
Bognor Regis,
West Sussex
PO22 0BP

7th June 2019

Ref: YFE11452Q1: Air Source Heat Pump installation

Dear Michael & Sally,

We thank you for the opportunity to price for this project. Please see our proposal for the installation detailed below:

Our Proposal



We propose to install a Global Energy Caernarfon 18KW Eco Air Source Heat Pump system (ASHP). The ASHP will replace your existing floor mounted Grant oil boiler.

We propose installing the new ASHP system outside of the walled garden between your existing oil tank and the wall (please see image to the right).





We will run pre-insulated pipe from the ASHP unit, under the garden wall, across the lawn and up through the patio area to then connect up inside.

We will cap off the oil supply, remove the oil boiler, modify the internal pipe work as required, install a buffer tank where your existing boiler is, and connect the new ASHP to the buffer tank to your existing

radiator circuit.

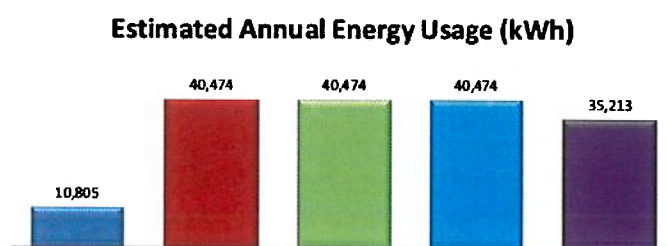
The domestic hot water cylinder will be removed and replaced with a new 250 litre Heat Pump hot water cylinder so that the heat pump can also provide all your domestic hot water.

We will carry out all mechanical and electrical work in order to complete the installation.



Estimated running costs, system efficiencies and fuel savings:

The table below show an indicative system efficiency of 327% compared to other heating options listed. Oil is showing a far lower efficiency of 87%, therefore the ASHP system is over 240% more efficient than your current oil alternative.



Heating Type	Heating Efficiency
ASHP	327%
Gas	87%
Oil	87%
LPG	87%
Electric	100%

1.1.1 Reduced running costs

The ASHP system will cost less to run per annum compared to your oil boiler based on the rates provided.

We have estimated that your property requires 12.9kW of heat to keep it warm at -1.8°C. This suggests an annual running cost of £1,810 offering a potential saving of £902 against Oil as your current fuel if you were to install the GES air source heat pump recommended. Please see the table below for more details.

ESTIMATED RUNNING COSTS & SAVINGS

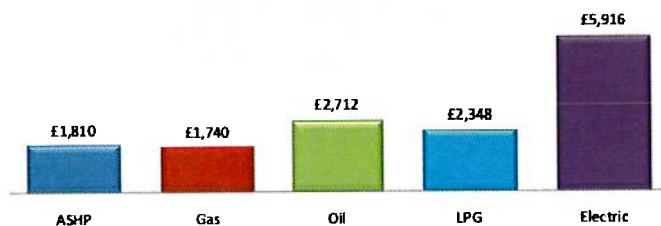
Estimated Property's Annual Energy Use (based on Detailed Calculation)	35,213 kWh
Current Annual Running Costs based on Oil at 65p/litre	£2,712
Air Source Heat Pump Annual Running Costs based on electric at 16.8p/kWh	£1,810
Annual RHI (Renewable Heat Incentive) Payment based on 10.71p/kWh*	£1,523
Annual Savings	£2,425

*Annual RHI has only been estimated. The actual payment will be calculated either from your properties EPC or from installed meters.

To estimate your payments from the RHI we have assumed that you will install a heating system designed at a flow temperature of 45deg.C (please refer to Heat Emitter Guide for more information). Based on our calculations 100% of your heating is provided by the heat pump.

The summary below shows a saving of circa **£900 per annum** compared to the current oil boiler system.

Estimated Annual Running Costs

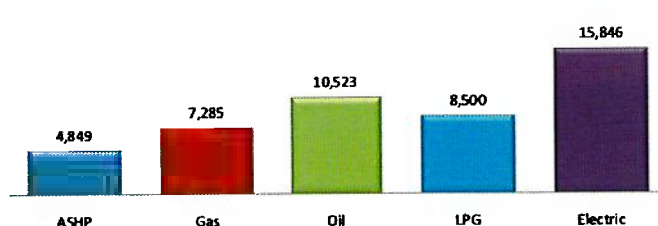


Heating Type	Energy Cost (p/kWh)
ASHP	5
Gas	4
Oil	7
LPG	6
Electric	17

1.2 Reduced carbon footprint

The tables below show indicative carbon reduction levels. The ASHP system is show a reduction in carbon emission of almost 5,600 tonnes per annum compared to oil. This equates to a 54% carbon saving.

Annual CO2 Emissions (kg)

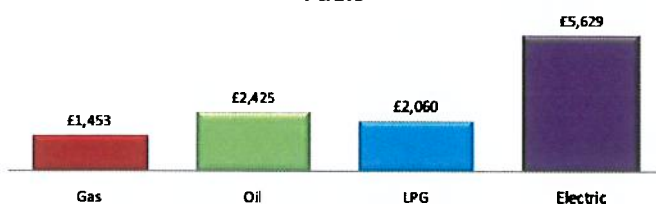


Heating Type	CO2 (kg/kWh)
ASHP	0.14
Gas	0.18
Oil	0.26
LPG	0.21
Electric	0.45

1.2.1 Annual Financial benefit

The ASHP system will qualify for the Domestic Renewable Heat Incentive (RHI) which will provide you with an indexed linked income for the next 7-years. In the first year this should show you an overall benefit of almost £2,500.

Total ASHP Annual Savings against Common Fuels



SCOP Heating	3.46
SCOP DHW	2.03
Supplementary Energy	30 kWh

Your properties current fuel source **Oil**
Oil Price Inflation Rate **5%** each YEAR
Electric Price Inflation Rate **5%** each YEAR

	CURRENT RUNNING COST	RUNNING COSTS WITH ASHP	ESTIMATED RIB PAYMENT	ESTIMATED ANNUAL SAVINGS	ACCUMULATED SAVINGS
Year 1	£2,712	£1,810	£1,523	£2,425	£2,425
Year 2	£2,947	£1,901	£1,599	£2,546	£4,970
Year 3	£2,990	£1,996	£1,679	£2,673	£7,644
Year 4	£3,139	£2,095	£1,763	£2,807	£10,450
Year 5	£3,296	£2,200	£1,851	£2,947	£13,397
Year 6	£3,461	£2,310	£1,944	£3,094	£16,492
Year 7	£3,634	£2,426	£2,041	£3,249	£19,741
Year 8	£3,816	£2,547		£1,269	£21,010
Year 9	£4,007	£2,674		£1,332	£22,342
Year 10	£4,207	£2,808		£1,399	£23,741
Year 11	£4,417	£2,949		£1,469	£25,209
Year 12	£4,638	£3,096		£1,542	£26,752
Year 13	£4,870	£3,251		£1,619	£28,371
Year 14	£5,113	£3,413		£1,700	£30,071
Year 15	£5,369	£3,584		£1,785	£31,856
Year 16	£5,638	£3,763		£1,874	£33,731
Year 17	£5,919	£3,951		£1,968	£35,699
Year 18	£6,215	£4,149		£2,067	£37,765
Year 19	£6,526	£4,356		£2,170	£39,935
Year 20	£6,853	£4,574		£2,278	£42,214
TOTAL	£89,668	£59,854	£12,400	£42,214	



The performance of a Microgeneration system is impossible to predict with certainty due to the variability of the climate and subsequent effects on both heating, hot water and electricity supply & demand. The estimate is based on the best available information, but is given as a guidance only, and should not be considered as a guarantee.

** Estimations based on current fuel prices provided of oil at 65p/litre and electricity at 16.8p/kWh.

We will carry out the following works:

Removal of existing plant:

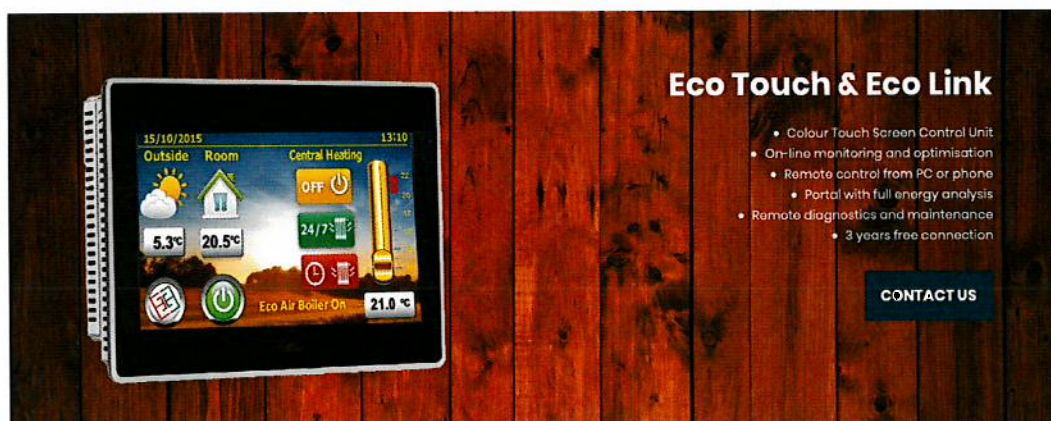
- Isolate & cap off oil supply
- Remove and disposal of existing floor mounted oil boiler
- Remove current domestic hot water cylinder

Air Source Heat Pump installation:

- Install and connect up pre-insulated heat main from new ASHP location to house
- Install new ASHP system, buffer tank and other associated plant room

equipment

- Install new domestic hot water (DHW) cylinder
- Install of Eco Touch & Eco Link remote monitoring system (3 years free connection included)
- Electrical works
- Commission ASHP system
- Assistance with RHI application



Exclusions:

We have not priced for the following works which will need to be carried out by your local builder:

- Base works for the ASHP to be sited on (we will provide the specification for them to build to)
- Trenching, back filling/re-instatement of ground
- Draining down and removal of oil tank

Radiator guide:

As discussed during our various conversations, ASHP systems work differently to that of a traditional fossil fuel boiler. They work much more efficiently, but for longer periods at a time and at much low temperatures. Whereas your current boiler will typically be timed to come on for a few hours in the morning and then a few hours in the evening, the ASHP system will work for much longer. This builds up the thermal mass of the building which means that over time, heat is retained far more effectively.

As part of the design process we have to carry out a room-by-room heat loss calculations. This was carried out by David Thomas of Global Energy Systems at our last meeting and below are the results:

Payment terms

This quotation will remain open for acceptance for 30 days from the date shown.
Stage payments as detailed below:

60% deposit upon signed contract

20% upon commencement of work

20% balance payment upon system commissioning and handover

Warrantees

3-years parts and labour. 1-year installation warranty.

We trust this meets with your approval and assure you of our best attention at all times.

Yours sincerely

David Nelson
Managing Director
Your Future Energy Ltd

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Room Name	Current Heat Emitter Output (Watts)	Current Heat Emitter Star Rating	Recommended Heat Emitter Star Rating	Recommended Heat Emitter Output (Watts) ¹	Heat Emitter Upgrade Required?	Room Specific Heat Loss per unit area	Estimated Radiator Size HxL (mm) ²	Room Temperature (deg.C)	Room Area (m2)	Heat Emitter Type to be installed
1 Dining Room	3,058	0 STAR	3 STAR	6,163	YES	100-120	2x 600x1600	21	25.2	Standard Radiator
2 Conservatory		0 STAR	3 STAR	1,661	YES	50-80	600x900	21	12.24	Standard Radiator
3 Dining Room			3 STAR	3,076	YES	80-100	600x1600	21	13.2	Standard Radiator
4 Kitchen	2,159	0 STAR	3 STAR	4,528	YES	80-100	2x 600x1300	18	23.1	Standard Radiator
5 Hall	700	2 STAR	3 STAR	848	YES	30-50	600x400	18	8.4	Standard Radiator
6 Office	700	0 STAR	3 STAR	1,087	YES	50-80	600x600	21	6.48	Standard Radiator
7 Bathroom		0 STAR	3 STAR	987	YES	50-80	600x500	22	5.4	Standard Radiator
8 Master Bed	818	0 STAR	3 STAR	2,480	YES	30-50	600x1400	18	23	Standard Radiator
9 Master bed e/s	1,637	3 STAR	3 STAR	1,508	NO	50-80	600x800	22	9.45	Standard Radiator
10 Master bed dressing			3 STAR	622	YES	30-50	600x400	18	7.29	Standard Radiator
11 Rear Bed	818	2 STAR	3 STAR	842	YES	30-50	600x400	18	9.45	Standard Radiator
12 Landing	485	4 STAR	3 STAR	286	NO	<30	600x400	18	6.3	Standard Radiator
13 Front Bed	2,810	2 STAR	3 STAR	3,510	YES	50-80	600x2000	18	24.42	Standard Radiator
14 End rear Bed	1,066	2 STAR	3 STAR	1,319	YES	50-80	600x700	18	8.48	Standard Radiator
15 Bathroom	682	3 STAR	3 STAR	648	NO	50-80	600x400	22	3.42	Standard Radiator
16 Wine Room	1,799	3 STAR	3 STAR	1,408	NO	50-80	600x800	21	10	Standard Radiator

The above show that a number of radiators may need to be increased in size, however, this is down to your personal preference as different people like rooms at different temperatures, and different houses perform in different ways. We believe the best way forward with this is to leave the system as is at present and see how you get on. Supplementary heat from the AGA or log burning stove may well be enough to boost the system, or there may be one or two radiators that after living through a complete winter, you may wish to upgrade at a later stage.

Planning permission:

As your house is in a conservation area, we would recommend you contacting your local Council to notify them of the installation. From experience, Councils are normally very happy about renewable energy installations, however, they may wish you to go through a planning application beforehand. Naturally, we will assist in providing system information should this be necessary.

ASHP system pricing:

Item	Description	£
	Installation on new Air Source Heat Pump system as detailed above	£ [REDACTED] net
	VAT (at %5)	£ [REDACTED]
	Total cost of installation	£ [REDACTED] inc VAT

** ASHP base, trenching, backfilling and making good to be carried out by others