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## ENERGY AUDIT REPORT Sample Home 2

**Detached Home of 92.85m<sup>2</sup> Built approx. 1995**  
**Block Cavity Walls, pitched roof insulated at joists, Oil Central Heating Current EPC rating – C (71) – Energy Use 172 kWh/m<sup>2</sup>/yr – Total Energy Use: 15,995 kWh/yr**

 	Existing Building Details	
	Building Elements	U-Value (W/m <sup>2</sup> .K)
Walls	Concrete Block Cavity 1995	0.45
Roof	Pitched Roof – Insulated at joists 300mm rockwool	0.15
Ground Floor	1995 Solid Floor (assumed 25mm expanded polystyrene)	0.47
Windows	Mostly Double-glazed, argon filled, low e coating, uPVC frames	1.7
Ext Door	½ glazed composite uPVC door	2.35

Existing Heating Characteristics			
Heating System		Energy	Efficiency (%)
Primary Heating System	Warmflow Kabin Pak K70HE	Oil	90.7
Secondary Heating System	none		
Domestic Hot Water	From primary system	Oil	90.7
Cylinder	25mm Insulated (jacket) 160L		
Controls	Prog, Room Stat & TRVs		

Domestic Retrofit Guidelines (Step by Step)						
Proposed Interventions		Energy saving (kWh/yr)	Energy saving (kWh/m <sup>2</sup> /yr)	Revised energy use (kWh/yr)	Revised BER Rating	CO <sub>2</sub> savings/yr (kg)
1	Upgrade Ext Doors to achieve 1.4W/m <sup>2</sup> K	275	169.28	15,718	C (71)	72
2	Upgrade windows to achieve 1.4W/m <sup>2</sup> K	228	166.83	15,490	C (72)	59
3	Int insulation to external walls to achieve 0.20W/m <sup>2</sup> K	4,016	123.57	11,474	C (79)	1,038
4	Install ASHP & associated radiator upgrades	3,169	89.44	8,305	B (84)	1,254
5	Install 2.5kW PV	5,823	26.73	2,482	A (95)	1,054
	Overall Savings Potential	13,511	145.52	2,482	A	3,477

Estimated Costs Summary			
Measures		Estimated Costs (£/m <sup>2</sup> )/Unit	Estimated Total Costs (£)
1	Upgrade 1 – upgrade Ext Doors to achieve 1.4W/m <sup>2</sup> K	£1,000.00 / door	£2,000.00
2	Upgrade 2 – Upgrade windows to achieve 0.7W/m <sup>2</sup> K	£400 / window	£2,400.00
3	Upgrade 3 – Int insulation to external walls to achieve 0.20W/m <sup>2</sup> K (gain low thermal mass & lower air permeability)	£150 / m <sup>2</sup> wall area	£16,950.00
4	Upgrade 4 – Install ASHP & associated radiator upgrades	£4,000.00 / house	£12,500.00
5	Upgrade 6 – Install 2.5kW PV	£4,000.00 / house	£4,000.00
<b>Total to achieve A rating</b>			<b>£37,850.00</b>
<b>PM Fee @ 8%</b>			<b>£3,028.00</b>
<b>Subtotal</b>			<b>£40,878.00</b>
<b>VAT @ 20% (5% on PV install)</b>			<b>£7,375.60</b>
<b>Total Build Costs</b>			<b>£48,253.60</b>
<b>Simple Payback</b>			<b>41 years</b>

Savings Summary				
BER Rating	Energy Use (kWh/m <sup>2</sup> /yr)	Energy Savings (kWh/yr)	Cost Savings (€/yr)*	CO2 Savings (kg)
Current C (71)	15,995			
Upgrade 1 C (71)	15,718	275	£27.50	72
Upgrade 2 C (72)	15,490	228	£22.80	59
Upgrade 3 C (79)	11,474	4,016	£401.60	1,038
Upgrade 4 C (76)	8,305	3,169	-£411.19	1,254
Upgrade 5 A (92)	2,482	5,823	£1,142.00	1,054
<b>TOTAL</b>	<b>2,482**</b>	<b>13,511</b>	<b>£1,182.71</b>	<b>3,477</b>

\*See 'Assumptions' Below

\*\* This represents 15% of the pre-upgrade energy consumption

To illustrate Carbon Dioxide savings: 1 10-year-old evergreen tree will absorb 14kg of CO<sub>2</sub> per year (deciduous absorb less). Therefore, the carbon savings of the works would be the equivalent of **planting 248 evergreen trees.**

## Savings Calculations

### Upgrade 1 (Ext door upgrade)

Space Heating 275 kWh x £0.10 (kerosene)	£27.5
Water Heating	no cost saving
Electricity	no cost saving
<b>TOTAL SAVED Ext Door upgrade</b>	<b>£27.50 per annum</b>

### Upgrade 2 (upgrade old windows)

Space Heating 228 kWh x £0.10 (kerosene)	£22.80
Water Heating	no cost saving
Electricity	no cost saving
<b>TOTAL SAVED Window Upgrade</b>	<b>£22.80 per annum</b>

### Upgrade 3 (int insulation to ext walls)

Space Heating 4,016 kWh x £0.10 (kerosene)	£401.60
Water Heating	no cost saving
Electricity	no cost saving
<b>TOTAL SAVED Ext wall Upgrade</b>	<b>£401.60 per annum</b>

### Upgrade 4 (Install ASHP)

#### *Current System*

Space & Water Heating Oil 8,503 kWh x £0.10 (kerosene)	£850.30
Electricity 2971 kWh x 0.2365 (elect)	£702.64
<b>Total Current System</b>	<b>£1,552.94</b>

#### *Upgraded System*

Space & Water Heating ASHP 6,005 kWh x £0.2365 (grid Elect)	£1,420.18
Elect 2300kWh x 0.2365 (elect)	£543.95
<b>Total Cost Upgraded System</b>	<b>£1,964.13</b>
<b>TOTAL Difference ASHP</b>	<b>-£411.19</b>

Upgrade 5 (Install PV)

Elect Saved with PV 5,822kWh x 70% usage x £0.2365	£963.83
Elect exported to grid 5,822kWh x 30% usage x £0.051	£89.08
<u>Total Saved PV</u>	<u>£1,142.00</u>

**TOTAL SAVED SYSTEM** **£1,182.71**

**Assumptions**

Kerosene produces 0.257kg CO<sub>2</sub> per kWh. This does not include emissions in production and transport

The amount of Carbon that is emitted per kWh Electricity in Northern Ireland is .330kg/kWh<sup>1</sup>

Electricity Rate pence per kWh = £0.2365

Kerosene cost per kWh = £0.10

Seasoned Wood & coal per kWh = £0.08<sup>2</sup>

<sup>1</sup> <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Northern%20Ireland%20Carbon%20Intensity%20Indicators%202021.pdf>

<sup>2</sup> <https://nottenergy.com/resources/energy-cost-comparison>