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ENERGY AUDIT REPORT
Sample Home 4

Detached Home of 81.77m², Original Building: pre 1900 with Solid Stone Walls
Bathroom Extn: 1960 Cavity Block, Kitchen Extn: 1994 Cavity Block
Current EPC rating – G (1) – Energy Use 965 kWh/m²/yr – Total Energy Use: 78,935 kWh/yr



Existing Building Details		
Building Elements		U-Value (W/m ² .K)
Walls	Original house = 440mm solid stone uninsulated	2.85
Walls	Bathroom extension added 1960 – Block Cavity uninsulated	2.02
Walls	Kitchen Extension added 1994 – Block Cavity - insulated	0.45
Roof	Pitched Roof – Insulated at joists to extensions 75mm rockwool	0.52
Roof	Original roof – Rafters & joists are uninsulated	2.3
Ground Floor	Original & 1960 extension is uninsulated	0.8
Ground Floor	1994 extension (assumed 25mm expanded Polystyrene)	0.55
Windows	Mostly Double-glazed, argon filled, low e coating, uPVC frames	1.7
Ext Door	½ glazed composite uPVC door	2.0

Existing Heating Characteristics			
Heating System		Energy	Efficiency (%)
Primary Heating System	No central heating installed.	N/A	N/A
Secondary Heating System	Open fire in grate	House coal	No data
Domestic Hot Water	Heated with Range Cooker	Oil	No data
Cylinder	Uninsulated cylinder		No data
Controls	No controls		

Domestic Retrofit Guidelines (Step by Step)						
Proposed Interventions		Energy saving (kWh/yr)	Energy saving (kWh/m2/yr)	Revised energy use (kWh/yr)	Revised BER Rating	CO2 savings/yr (kg)
	Original House		965	78,935	G (1)	
1	Install Internal insulation to upgrade walls to 0.22w/m2K	36,611	617.51	42,324	F (31)	14,350
2	Upgrade the roof insulation to 0.15 at rafters & 0.2 at joists	10,841	132.57	31,483	E (46)	3,080
3	Install ASHP	22,349	273.32	9,134	B (82)	6,642
4	Install 2.5kWp PV	5,823	71.2	3,311	A (93)	1,055
	Overall kWh/m2/yr Savings Potential	75,624		3,311	A	25,127

Estimated Costs Summary			
Measures		Estimated Costs (£/m ²)/ element	Estimated Total Costs (£)
1	Int Insulation	£150 / m2 wall area	£21,395.00
2	Roof Insulation	£60 / m2 rafter roof area £25 / m2 joists roof area	£1,865.00
3	Install ASHP central heating system & associated controls (incl. all pipe-runs etc)	£15,000.00 / house	£15,000.00
4	Install 2.5kWp PV	£4,000.00 / house	£4,000.00
Total to achieve C rating			£42,260.00
PM Fee (8%)			£3,380.80
Subtotal			£45,640.80
VAT (20% & 5% PV)			£8,296.00
Total Build Costs			£53,937.00
Simple Payback			5 years

Savings Summary				
BER Rating	Energy Use (kWh/yr)	Energy Savings (kWh/yr)	Cost Savings (€/yr)*	CO2 Savings (kg)
Current G (1)	78,935	()	0.00	
Upgrade 1 F (31)	42,324	50,493	£8,331.00	14,350
Upgrade 2 E (46)	31,483	10,841	£997.33	3,080
Upgrade 3 B (82)	9,134	22,349	£979.00	6,642
Upgrade 4 (93)	3,311	5,823	£1,142.00	1,055
TOTAL	3,311**		£11,449.00	25,127

*See 'Assumptions' Below

** This represents 18% of the pre-upgrade energy consumption

To illustrate Carbon Dioxide savings: 1 10-year-old evergreen tree will absorb 14kg of CO2 per year (deciduous absorb less). Therefore, the carbon savings of the works would be the equivalent of **planting 1,795 evergreen trees.**

Savings Calculations

Upgrade 1

Space Heating 45,829 kWh x £0.08 (coal / wood)	£3,666.00
Secondary Heating 4,665kWh x £0.2365 (elect)	£4,665.00
Water Heating	no cost saving
Electricity	no cost saving
TOTAL	£8,331.00

Upgrade 2

Space Heating 9,839 kWh x £0.08 (coal / wood)	£787.12
Secondary Heating 1,001kWh x £0.2365 (elect)	£210.21
Water Heating	no cost saving
Electricity	no cost saving
TOTAL	£997.33

Upgrade 3 (before change to ASHP)

Space Heating 17,132 kWh x £0.08 (coal / wood)	£1,371.00
Secondary Heating 1,744kWh x £0.2365 (elect)	£366.00
Water Heating 11,580 x £0.10 (oil)	£1,158.00
Total Before change to ASHP	£2,895.00

Upgrade 3 (after change to ASHP)

Space Heating 4,655 kWh x £0.2365 (grid electricity)	£1,100.00
Secondary Heating	
Water Heating 3,452 x £0.2365 (grid electricity)	£816.00
TOTAL After change to ASHP	£1,916.00
TOTAL SAVING	£979.00

Upgrade 4 (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
Total Saved PV	£1,142.00
TOTAL SAVINGS ALL UPGRADES:	£11,449.00

Assumptions

Kerosene produces 0.257kg CO₂ 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/kWh¹

Electricity Rate pence per kWh = £0.2365

Kerosene cost per kWh = £0.10

Seasoned Wood & coal per kWh = £0.08²

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

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