This Publishable Report is provided as part of The Rathlin Sustainable Island Network study and is for illustrative public information purposes. The building owner's reports are confidential and thus not published here.

ENERGY AUDIT REPORT

Sample Home 6

Detached Home of 85.92m2 Original Building: pre 1900 with Solid Stone Walls
House extended in 2002. Current EPC rating – E (44) – Energy Use 337 kWh/m^{2}/yr
Total Energy Use: 28,948 kWh/yr

Existing Building Details

Building Elements		U-Value (W/m^{2}.K)
Walls	Original house = 440mm solid stone uninsulated	2.67
Walls	Extension added 2002 – Block Cavity insulated	0.3
Roof	Extension Pitched Roof – Insulated at joists 200mm rockwool	0.21
Roof	Original roof – Rafters & joists are uninsulated	2.48
Ground Floor	Original is uninsulated	0.8
Ground Floor	2002 extension (100mm Xtratherm Thin-R)	0.16
Windows	Double-glazed (2002), argon filled, low e coating, uPVC frames	1.7
Ext Door	Fully Glazed uPVC doors	1.7

Existing Heating Characteristics			
Heating System		Energy	Efficiency (%)
Primary Heating System	Firebird Silverpac C20KW	Kerosene	91.3
Secondary Heating System	Range	Kerosene	65
Domestic Hot Water	From Primary Heating System	Kerosene	91.3
Cylinder	160L cylinder with 25mm Jacket Insulation		
Controls	Programmer, Room Stat & TRVs		

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)
1	Int Insulation to Stone Walls (upgrade from 2.67 w/m2K to 0.24 w/m2K)	9,276	107.95	19,672	D (62)	2,398
2	Insulation to Orig House Rafters (upgrade from 2.48 w/m2K to 0.20 w/m2K)	5,068	58.99	14,604	C (72)	1,310
3	Install 2.5kWp PV	10,026	116.69	4,578	A (92)	1,816
	Overall Savings Potential	24,370	283.63	4,578		5,524

Estimated Costs Summary			
Measures		Estimated Costs (£/m²)/ element	Estimated Total Costs (£)
1	Int insulation to stone walls	£150/m2 wall area	£8,179.50
2	Insulation to roof at Rafters	£60 / m2 roof area	£3,005.40
3	Install 4.0KW PV & Link to Hot Water	£6,000.00	£6,000.00
Total to achieve A rating			**£17,194.90**
PM Fee (8%)			**£1,374.79**
Subtotal			**£18,559.69**
VAT (20% + 5% on PV)			**£2,811.86**
Total Build Costs			**£21,371.55**
Simple Payback			**7yrs**

Savings Summary					
BER Rating	Energy Use (kWh/yr)	Energy Use (kWh/m^2/yr)	Energy Savings (kWh/yr)	Cost Savings (€/yr)*	CO2 Savings (kg)
Current E (44)	**28,948**	337	()	0.00	
Upgrade 1 D (62) Wall Insulation	19,672	229	9,276	£727.60	2,398
Upgrade 2 C (72) Rafter Insulation	14,604	59	5,068	£506.80	1,555
Upgrade 3 A (92) Install PV	4,578	53	10,026	£1,813.20	1,649
TOTAL	**4,578**	**53**	**24,370**	**£3,047.60**	**5,524**

*See 'Assumptions' Below

** This represents 16% 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 395 evergreen trees.**

Savings Calculations

Upgrade 1 (Insulation to stone Walls)		
Space & Water Heating 7,276 kWh x £0.10 (kerosene)		£727.60
Total Savings		£727.60
Upgrade 2 (Insulation to old roof)		
Space & Water Heating 5,068 kWh x £0.10 (kerosene)		£506.80
Total Savings		£506.80
Upgrade 3 (Install PV)		
Elect Saved with PV: 10,026kWh x 70% usage x £0.2365 (grid elect)		£1,659.80
Elect exported to grid	10,026kWh x 30% usage x £0.051 (grid elect)	£153.40
Total Savings PV		£1,813.20
TOTAL SAVINGS ALL UPGRADES:		£3,047.60

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/kWh[1]

Electricity Rate pence per kWh = £0.2365

Kerosene cost per kWh = £0.10

Seasoned Wood & coal per kWh = £0.08[2]

[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