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 5

Detached Home of 71m2 Built approx. 1900
Solid Stone Walls, Pitched roof insulated at rafters with 100mm rockwool, pitched roof uninsulated at rafters, Oil Central Heating (condensing combi boiler)
Current EPC rating – F (33) – Energy Use 458 kWh/m^{2}/yr – Total Energy Use: 32,518 kWh/yr

Existing Building Details

Building Elements		U-Value (W/m^2.K)
Walls	Solid Stone Walls	2.73
Roof	Pitched Roof – Insulated at rafters 100mm rockwool	0.44
Ground Floor	Solid Floor (100mm expanded polystyrene retro fitted)	0.22
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	Warmflow Kabin Pak Combi 70 HE ECO	Oil	88.7
Secondary Heating System	Wood burning stove	Wood	No data
Domestic Hot Water	From primary system	Oil	88.7
Cylinder	N/A		
Controls	Prog & Room Stat		

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		457.587	32,534	F (33)	
1	Upgrade 1 – upgrade Ext Doors to achieve 1.8W/m2K & install triple glazing throughout 0.7w/m2K	839	445.78	31,695	F (34)	187
2	Upgrade 2 – Int insulation to ext walls to achieve 0.22w/m2K	13,819	251.43	17,876	D (62)	3,083
3	Upgrade 3 – Roof to achieve 0.19w/m2K	5,854	169.10	12,022	C (74)	1,305
4	Upgrade 4 – Install 3.6kWp PV	8,636	47.63	3,386	A (93)	1,565
	Overall kWh/m2/yr Savings Potential	29,148	409.95	3,386		6,140

Estimated Costs Summary			
Measures		Estimated Costs (£/m²)/Element	Estimated Total Costs (£)
1	Upgrade 1 – upgrade Ext Doors to achieve 1.8W/m2K & install triple glazing throughout 0.7w/m2K	£1000 / door £400 / wdw	£6,000.00
2	Upgrade 2 – Int insulation to ext walls to achieve 0.22w/m2K	£155 / m2	£16,585.00
3	Upgrade 3 – Roof to achieve 0.19w/m2K	£50 / m2 roof area	£3,800.00
4	Upgrade 4 – Install 3.6kWp PV	£5,000.00 / house	£5,000.00
Total to achieve D rating			**£31,385.00**
PM Fee (8%)			**£2,510.80**
Sub-Total			**£33,895.8**
VAT (20%)			**£6,029.00**
Total Build Costs			**£39,924.80**
Simple Payback			**12.5 yrs**

Savings Summary					
BER Rating	Energy Use (kWh/yr)	Energy Use (kWh/m²/yr)	Energy Savings (kWh/yr)	Cost Savings (€/yr)*	CO2 Savings (kg)
Current F (33)	32,534	457.57	()	0.00	
Upgrade 1 F (34)	31,695	445.78	839	£29.32	187
Upgrade 2 D (62)	17,876	251.43	13,819	£1,343.00	3,083
Upgrade 3 C (74)	12,022	169.10	5,854	£568.82	1,305
Upgrade 4 A (93)	3,386	47.63	3,386	£1,241.00	1,565
	3,386**		**29,148**	**£3,182.14**	**6,140**

*See 'Assumptions' Below

** This represents 10% 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 438 evergreen trees.**

Savings Calculations

Upgrade 1 (Doors & Windows)	
Space Heating 725 kWh x £0.10 (kerosene)	£19.80
Secondary Heating 119kWh x £0.08 (seasoned wood)	£9.52
Water Heating	incl above
Electricity	no cost saving
Total Saved Double Glazing	£29.32 per annum
Upgrade 2 (Insulation to internal walls)	
Space Heating 11,867 kWh x £0.10 (kerosene)	£1,186.70
Secondary Heating 1,952kWh x £0.08 (seasoned wood)	£156.16
Water Heating	incl above
Electricity	no cost saving
Total Saved Wall Insulation	£1,343.00 per annum
Upgrade 3 (Insulation to rafters)	
Space Heating 5,025 kWh x £0.10 (kerosene)	£502.50
Secondary Heating 829kWh x £0.08 (seasoned wood)	£66.32
Water Heating	incl above
Electricity	no cost saving
Total Saved Wall Insulation	£568.82 per annum
Upgrade 4 (PV)	
PV used: 8,636 kWh x 50% x £0.2365	£1,021.00
Export to grid: 8,636 kWh x 50% x £0.051	£220.00
Total Saved PV	£1,241.00 per annum
TOTAL SAVED All Upgrades	**£3,182.14**

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