

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 3

Detached Home of 92.85m² Built approx. 1995
Block Cavity Walls, Pitched roof insulated at joists, Oil Central Heating
Current EPC rating – D (67) – Energy Use 172 kWh/m²/yr – Total Energy Use: 15,995 kWh/yr



Existing Building Details			
Building Elements		U-Value (W/m ² .K)	Heat Loss (AU) [W/K]
Walls	Concrete Block Cavity 1995	0.45	
Roof	Pitched Roof – Insulated at joists 100mm rockwool	0.52	
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 ² /yr)	Revised energy use (kWh/yr)	Revised BER Rating	CO2 savings/yr (kg)
	Original House		201.19	18,680	D (67)	-
1	Upgrade 1 – upgrade Ext Doors to achieve 1.4W/m ² K	295	198.01	18,385	D (67)	78
2	Upgrade 2 – Upgrade windows to achieve 1.4W/m ² K	248	195.34	18,137	D (68)	66
3	Upgrade 3 – Int insulation to external walls to achieve 0.20W/m ² K & Roof to achieve 0.11	5,357	137.86	12,780	C (77)	1,412
4	Upgrade 4 – Install ASHP & associated radiator upgrades	3,543	99.47	9,237	B (83)	1,460
5	Upgrade 5 – Install 2.5kW PV	5,822	36.77	3,414	A (94)	1,054
	Overall Savings Potential	15,265	164.42	3,414	A	4,070

Estimated Costs Summary		
Measures	Estimated Costs (£/m ²)/Unit	Estimated Total Costs (£)
1 Upgrade 1 – upgrade Ext Doors to achieve 1.4W/m2K	£1,000.00 / door	£2,000.00
2 Upgrade 2 – Upgrade windows to achieve 0.7W/m2K	£400 / unit	£2,400.00
3 Upgrade 3 – Int insulation to external walls to achieve 0.20W/m2K Addit 300mm rockwool to joists (gain low thermal mass & lower air permeability)	£155 / m2 wall area	£17,515.00
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
Total to achieve B rating		£38,415
PM Fee @ 8%		£3,073.20
Subtotal		£41,488.20
VAT @ 20% (5% on PV install)		£7,697.60
Total Build Costs		£49,185.60
Simple Payback		34 years

Savings Summary				
BER Rating	Energy Use (kWh/yr)	Energy Savings (kWh/yr)	Cost Savings (€/yr)*	CO2 Savings (kg)
Current C (71)	18,680			
Upgrade 1 C (71)	18,385	295	£19.80	76
Upgrade 2 C (72)	18,137	248	£24.80	64
Upgrade 3 C (79)	12,780	5,357	£535.70	1,377
Upgrade 4 C (76)	9,237	3,543	-£263.46	910
Upgrade 5 A (92)	3,414	5,822	£1,142.00	1,496
TOTAL	3,414**		£1,458.84	3,923

*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 280 evergreen trees.**

Savings Calculations

Upgrade 1 (Ext door upgrade)

Space Heating 198 kWh x £0.10 (kerosene)	£19.80
Water Heating	no cost saving
Electricity	no cost saving
TOTAL SAVED Ext Door upgrade	£19.80 per annum

Upgrade 2 (upgrade old windows)

Space Heating 248 kWh x £0.10 (kerosene)	£24.80
Water Heating	no cost saving
Electricity	no cost saving
TOTAL SAVED Window Upgrade	£24.80 per annum

Upgrade 3 (int insulation to ext walls)

Space Heating 5,357 kWh x £0.10 (kerosene)	£535.70
Water Heating	no cost saving
Electricity	no cost saving
TOTAL SAVED Ext wall Upgrade	£535.70 per annum

Upgrade 4 (Install ASHP)

System Costs after upgrades 1-3

Space & Water Heating Oil 9,836kWh x £0.10 (kerosene)	£983.60
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Upgrade 4 System Costs

Space & Water Heating ASHP 6,944kWh x £0.2365 (grid Elect)	£1,642.26
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TOTAL SAVED post Upgrade 4	-£263.46
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Upgrade 5 (Install PV)

Elect Saved with PV: 5,822kWh x 70% usage x £0.2365	£963.83
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Elect exported to grid: 5,822kWh x 30% usage x £0.051	£89.08
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Total Saved PV	£1,142.00
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TOTAL SAVED ALL WORKS:	£1,458.84
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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>