Communities 2020

Energy Audits & Feedback on Applications

SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Rialtas na hÉireann
Government of Ireland

www.seai.ie

Agenda

- Recap on Communities VFM Evaluation Criteria
- Energy Audits – Overview
- Energy Audits for Communities Support/TWB
- Key Learnings/Evaluation Feedback
- Summary

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Value For Money – Recap on SEAI Communities criteria

- Investment Cost (€)/ Primary kWh saving *(Max 15)*
- Carbon Savings: Total Cost per Kg CO_2 saved (€) *(Max 10)*
- Energy Savings % *(Max 15)*

SECTION A – Administration

Table A

Summary of Project Finances	Project Costs Euro (€)	Per kWh Saved Euro (€)
Total Eligible Costs		
Total SEAI Grant	[illegible]	
Grant %	[illegible]	
Total kWh Saved		
Energy Savings %	[illegible]	

0.00	Total Cost (€)/Carbon Savings kg CO2

Energy Survey / Audit Report

It's a key input to the Communities Form A Application/TWB

Energy Audit Report basics:

- Site annual energy use in kWh & cost (€)
- Identification of Upgrade measures - EE/RE Opportunities
- Provides Technical Description/Investment Cost for measures
- Assesses the Cost-Benefit/Value Proposition (Payback period)

Energy Audit / Survey Overview – What is it ?

An energy audit is an inspection, survey and analysis of energy flows. It allows for identification of energy savings opportunities in a building, process or system to reduce the amount of energy input into the system, without negatively affecting the output(s).

Ref: “Page 6 of SEAI Energy Audit Handbook”
Web-link: https://www.seai.ie/publications/SEAI-Energy-Audit-Handbook.pdf

Components of Energy Audit Report

- Scope of audit & Executive Summary
- Site annual energy usage (kWh) & cost (€)
- Main energy uses (SEUs) and performance vs KPI/Benchmarks
- Opportunity assessment including ranking *(Opportunity Register)*
- Technical description *(with support metrics e.g. COP, U-values, etc.)*
- Detailed cost and savings assessment for recommended measures *(Use of SEAI tools)*
- Summary

Site energy use example (use utility bills here mostly for data)

3.0 Heating Bills

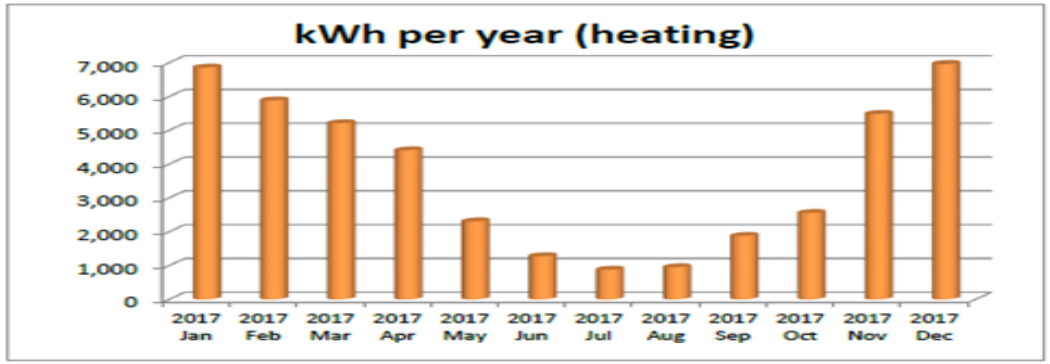

Figure 3.1 Oil usage summary

Oil Bill Summary

Date	kWh used	Total cost of bill
Jan 2017	6,860	€480
Feb 2017	5,883	€412
Mar 2017	5,207	€365
Apr 2017	4,406	€308
May 2017	2,303	€161
Jun 2017	1,277	€89
Jul 2017	876	€61
Aug 2017	951	€67
Sep 2017	1,878	€131
Oct 2017	2,554	€179
Nov 2017	5,483	€384
Dec 2017	6,960	€487
Total	44,638	€2,901

Table 3.1 Oil usage summary

4.0 Electricity Bills

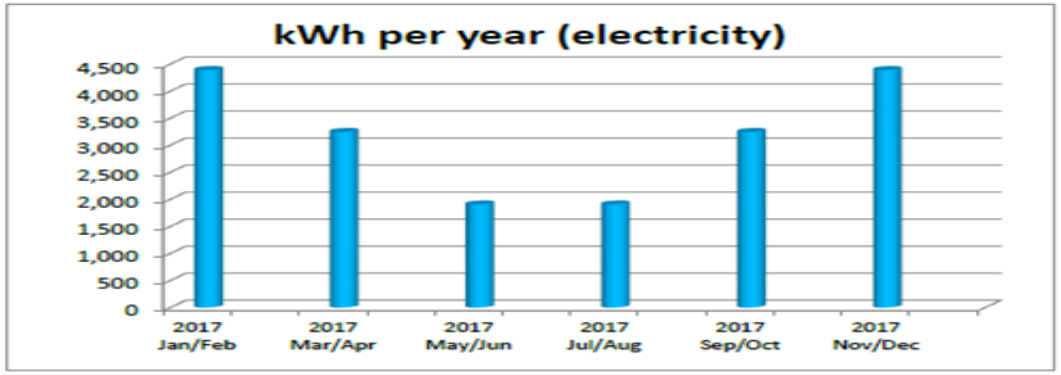

Figure 4.1 Electricity bills summary

Electricity Bill Summary

Date	kWh used	Total cost of bill
Jan/Feb 2017	4,393	€703
Mar/Apr 2017	3,247	€520
May/Jun 2017	1,910	€306
Jul/Aug 2017	1,910	€306
Sep/Oct 2017	3,247	€520
Nov/Dec 2017	4,393	€703
Total	19,102	€3,056

Table 4.1 Electricity bills summary

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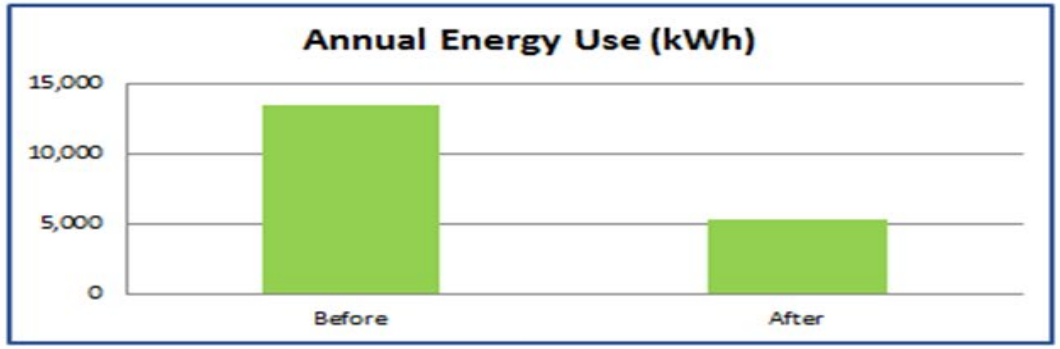
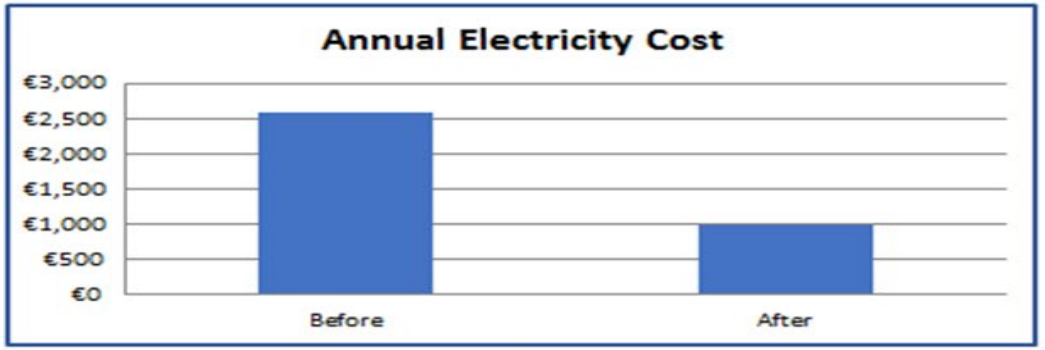
SEAI Lighting calculator summary from SEAI Lighting tool:





Survey Information	Before	After
Number of fittings:	65	68
Total Wattage kW	4	2
Watts/m²	2	1
Zones with controls	1	1

Energy Consumption	Before	After
Annual kWh	13,442	5,229
Annual Cost	€2,578	€1,001

Savings Identified		
Annual Savings		
kWh	8,213	kWh
CO_2	3.4	tonnes
Energy Cost Saving	€1,577	
Economics		
Capital Costs	€6,080	
Payback	3.86	years

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Lighting tool worksheet extract:

Original Luminaire:

Luminaire Photo ref	Lighting type [Selection must be made]	Description	Lamp Watts (ex control gear)	No. of luminaires	No. of lamps	Daylight control fitted?	Occupancy control fitted?	kW before
	Fluorescent T8 MB	1 x 58W T8	58	1	1	No	No	0.1
	Fluorescent 2D MB	28W 2D	28	56	56	No	Yes	2.0
	Fluorescent T5	2 x 49W T5	98	1	1	No	No	0.1
	Fluorescent T8 MB	4 x 18 T8	72	2	2	No	No	0.2
	Fluorescent Compact	8W CFL	8	4	4	No	No	0.0

New Luminaire:

Lighting type [Selection must be made]	Description	Enter Luminaire Watts	No. of new luminaires:	Enter Triple E LIG code	Daylight control?	Occupancy control?	Triple E Luminaire Details	Triple-E Watts ±5%	kW after
New fitting (Triple E or equivalent)	1 x 20W	20	1		No	No			0.0
New fitting (Triple E or equivalent)	14W 2D	14	54		No	Yes			0.8
New fitting (Triple E or equivalent)	2 x 20W	40	1		No	No			0.0
New fitting (Triple E or equivalent)	30W	30	2		No	No			0.1
Emergency lighting: Signage – maintained	3w	3	4		No	No			0.0

Zone Summary:

Original Luminaires kWh pa	New Luminaires kWh pa	Hours of use	Saving kWh pa +/-	Saving kWh pa +/- (%)	CO_2 reduction (kg pa)
324	97	4,862	227	70%	93
8,577	3,308	4,862	5,268	61%	2,155
476	194	4,862	282	59%	115
474	172	2,860	302	64%	124
159	60	4,862	99	63%	41

TWB evaluators feedback to SEAI…

- Mostly positive…
- TWB key spreadsheet but check aligned with Form A ?
- Energy Audit Report & TWB aligned ?
- Costs/Credits & Technical Description focus on ***TECHNICAL*** description.

Lighting: *Quantity & Capacity*
Fabric: *Surface area & U-value/thermal conductivity*
Heat Pump: *Quantity, Heating Capacity (kW) & COP*
PV: *# of panels/arrays with capacity (kW_p) & # of Inverters & capacity (kW 1-ph or 3-ph) (Is Battery/Cell Storage a feature ?)*

Please Avoid We hope to improve heating/comfort with a new heat pump and underfloor heating…

TWB evaluators feedback…site energy use:

10	Floor Area of building	
11	Occupancy Hours (hrs)	4,368.00
12	Current Annual Electrical Use kWh/yr	125651
13	Current Annual Thermal Use kWh/yr	?
14	Current Annual Fleet Use kWh/yr	0

10	Floor Area of building	
11	Occupancy Hours (hrs)	4,368.00
12	Current Annual Electrical Use kWh/yr	125651
13	Current Annual Thermal Use kWh/yr	60000.8
14	Current Annual Fleet Use kWh/yr	0

TWB evaluators feedback…PV

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TWB evaluators feedback…Heat Pump

Proposed Specification	Additional Information	Equip ID register Ref ID - where proposed	Electrical Savings kWh	Thermal Savings kWh	Fleet Savings kWh	Renewables Savings kWh
Replace the internal and external non-LED lights with high-performance LED light fittings/bulbs: 6no. 10W bulbs, 18no. 20W bulbs, 3no. 50W floodlights, 25no. 2D fittings, 3no. 600x600 40W fittings, 43no 60W fittings		LIG64537 LIG64538 LIG70877 LIG75379 LIG75380 LIG75954	12,434	0	0	0
Supply and install 2no 11.2 KW Air to Water heat pumps split units and 1no. 7.5kw Air to Water heat pump split unit with 200 litre cylinder. . Carrying out a chemical flushing of the existing radiator system. Installation of TRVs to 50% of the radiators. Installation of mechanically assisted power cleanse and flush. Total capacity of heat pumps = 29.5kW. Supply temp 40 C. COP 2.91. 200L HW cylinder. 90% heating, 10% hot water.			?	83778	0	0

Proposed Specification	Additional Information	Equip ID register Ref ID - where proposed	Electrical Savings kWh	Thermal Savings kWh	Fleet Savings kWh	Renewables Savings kWh
Replace the internal and external non-LED lights with high-performance LED light fittings/bulbs: 6no. 10W bulbs, 18no. 20W bulbs, 3no. 50W floodlights, 25no. 2D fittings, 3no. 600x600 40W fittings, 43no 60W fittings		LIG64537 LIG64538 LIG70877 LIG75379 LIG75380 LIG75954	12,434	0	0	0
Supply and install 2no 11.2 KW Air to Water heat pumps split units and 1no. 7.5kw Air to Water heat pump split unit with 200 litre cylinder. . Carrying out a chemical flushing of the existing radiator system. Installation of TRVs to 50% of the radiators. Installation of mechanically assisted power cleanse and flush. Total capacity of heat pumps = 29.5kW. Supply temp 40 C. COP 2.91. 200L HW cylinder. 90% heating, 10% hot water.			-83917	83778	0	0

TWB evaluators feedback

Fabric upgrades … Ensure U values/Thermal Conductivity meet the minimum specification and state the upgrade measure values in TWB…..

Measure	**Minimum Specification - All measures installed must meet the minimum specification listed below**
Roof Insulation	Insulation as per TGD L 2008 • On the ceiling to U-Value 0.16 W/m²K • On the rafter to 0.2 W/m²K • On flat roofs to 0.22 W/m²K
External Wall Insulation	To U-Value 0.27 W/m²K as per TGDL 2008
Internal Dry Lining Wall Insulation	To U-Value 0.27 W/m²K as per TGDL 2008
Cavity Wall Insulation	To U-Value 0.50 W/m²K
Floor Insulation	To U-Value 0.36 W/m²K
Full Window Replacement (incl doors with > 60% glazing)	To U-Value 1.4 W/m²K
Window glazing envelope replacement (includes doors with > 60% glazing)	Minimum glazing envelopes U-Value 2.1 W/m²K
External Door Replacement	To U-Value 1.4 W/m²K
Window glazing Low e film (includes doors with > 60% glazing)	Post installation U-Values according to EN 410 and EN 673: • Minimum double glazing envelope U-Value 2.4 W/m²K • Minimum single glazing envelope U-Value 3.5 W/m²K Glazing film shall be professional installed by manufacture trained/registered installers.

Consistent information with updated / revised application

- Expect the site energy to remain the same *(%savings impact)* ☑
- Measure cost is the total investment cost….*(Investment Cost (€)/ Primary kWh saving impact)* ☑
- Use PV calculator on TWB though may have individual PV audit report with global irradiation level/ m^2 *(credits..)* ☑
- Payback period should be within ‘reasonable range *(metric of VFM impacted anyway)…(e.g. Fabric PP was 167 years)* ☒

Remember Value For Money Criteria

- Investment Cost (€)/ Primary kWh saving *(Max 15)*
- Carbon Savings: Total Cost per Kg CO_2 saved (€) *(Max 10)*
- Energy Savings % *(Max 15*)

Energy Audit / Survey is key input data for TWB

In Summary

- Looked at the Communities VFM Criteria
- Energy Audits – Overview
- Energy Audits for Communities/TWB
- Key Learnings / Evaluation Feedback

Looked at the Communities VFM Criteria

Investment Cost (€)/ Primary kWh saving (Max 15)
Carbon Savings: Total Cost per Kg CO_2 saved (€) (Max 10)
Energy Savings % (Max 15)

Energy Audits – Overview

Energy Audit Report basics:
Site annual energy use in kWh & cost (€).
Significant energy uses on the site.
Identification of Upgrade measures - EE/RE Opportunities including KPI/Benchmarks
Provides Technical Description/Investment Cost for measures
Assesses the Cost-Benefit/Value Proposition (Payback period)

Energy Audits for Communities/TWB – It's a key input at application stage

Utility bills for energy use
Main uses of energy at the site & Performance relative to Good Practise.
Identification of improvement resulting in a Register of Opportunities
Rank order of improvements with cost & technical description of the upgrade measures
Cost Benefit analysis including Payback period.

Key Learnings / Evaluators Feedback

Mainly positive …..
Use Succinct Technical Descriptions
Alignment of Energy Audit Reports/TWB & Form A
Investment Cost/Savings -----Payback period (…..reasonable….)

Thank You

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