CASTLEPOLLARD

Sustainable Energy Master Plan

Achieving Zero carbon energy

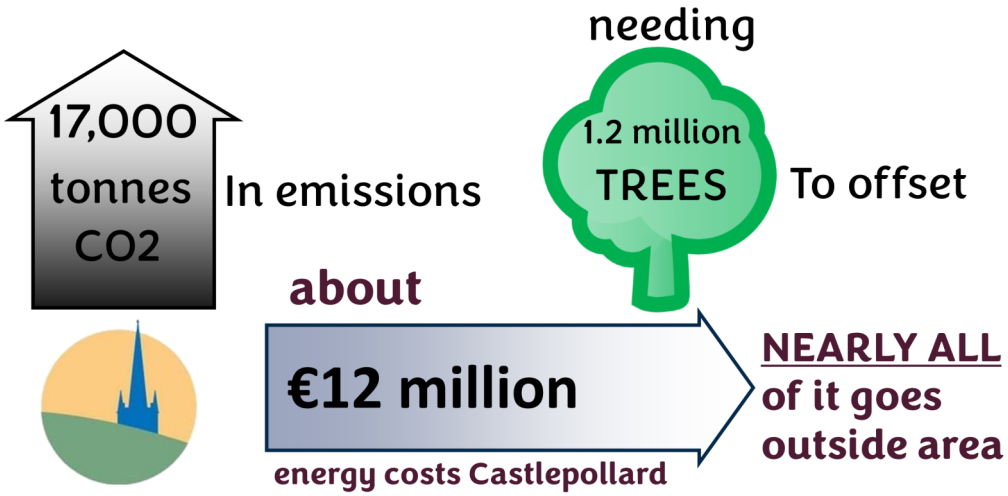
Supported by

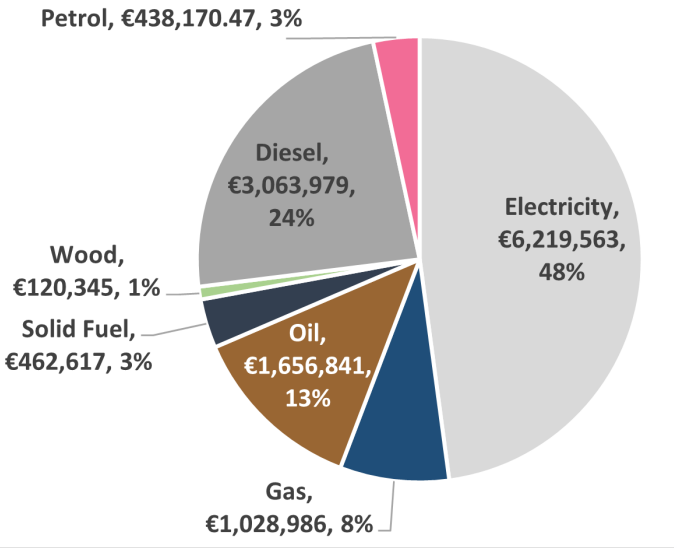
seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

WESTMEATH COUNTY COUNCIL
COMHAIRLE CHONTAE NA h-IARMHÍ

What is the cost of energy in Castlepollard?

Like most communities in Ireland Castlepollard imports its energy. This is nearly all in the form of fossil fuels from abroad.
The area loses a significant amount of income (approximately €12m) on energy costs some of which could be kept in the community.
As this energy is in the form of diesel, home heating oil, and coal, this produces a lot of pollution. All this can be avoided by following the steps outlined here.





What is Castlepollard's Energy *Balance*?

If we take action, we can reduce the amount of oil, coal, and electricity we use to heat our homes by making them cosier and more efficient: we can save money and reduce emissions. The same is true of community buildings and businesses—most can achieve 30% reduction with quite short payback periods <10 year. Most diesel and petrol use can be replaced by renewable electric. Clean green electricity can be produced cost effectively in homes and at our places of work without negatively effecting our environment or heritage.

Castlepollard Sustainable Energy Plan

Castlepollard Sustainable Energy Community (SEC), supported and funded by the Sustainable Energy Association of Ireland, commissioned a full study of the energy uses of all sectors of Castlepollard and the surrounding areas. This study also measured the carbon emissions produced by this energy use. Energy Co-operatives Ireland carried out onsite surveys of homes community, and other public buildings. The study also examined energy use in business, community, and transport. FULL REPORT AT**: energyco-ops.ie/Castlepollard** including **all references for this document**

Achieve Sustainability in your home

Our research found that the homes of Castlepollard produce higher emissions than the average in Ireland:

The average home in Castlepollard uses 25,015 kWh/yr of energy each year. This is well above the national average of 20,424 kWh/yr. Some of this is due to the relative size of homes in the area (which are also detached houses and thus exposed on all sides) as well as the lack of availability of natural gas which is much less carbon intensive than most other home heating fuels. The houses in parts of the SEC are older than typical for both Ireland and Westmeath. Perhaps it is now time to future proof these homes for the generations ahead.

Step	Item	Action	BER post action	Energy Costs Post Action	CO2 emissions post action
0	Current State	No Upgrades	G	€6,316.48	27,639
1	Insulation Attic	Upgrade Attic Insulation to 300mm+	F	€5,126.46	22,432
2	Roof Insulation	Flat Roof Insulation	E2	€4,342.98	19,004
3	Internal Insulation	Insulated Plasterboard internally on original stone walls	E1	€3,793.19	16,597
4	External Insulation	Extension Walls	D1	€3,042.05	13,311
5	Windows	Change Single Glazed Windows to < 1.1 w/m2k or better	D1	€3,870.69	16,937
6	Secondary Heating System	Remove Range Cooker	D1	€2,980.12	13,040
7	Heating System	Air to Water Heat Pump for heating and hot water	B1	€1,696.60	7,424
8	Photovoltaic	6 PV Panels to South facing roof 2.19 kWp	A2	€1,027.71	2,453

A G-rated home (the lowest) can be upgraded to an A2 rating saving up to €5,288.77 per year in heating costs and 25,186 kg of CO2 emissions following the actions recommended by our survey of a Castlepollard home.

There are grants available based on set grants per measure, this can be grant funded by SEAI. Full List of Grants Amounts available at this link: https://www.seai.ie/grants/community-grants/overview/

Taking a grouped, staged approach to improving the energy efficiencies of the SEC's homes will enable the community to move forward rapidly to sustainability. There are improved grants and efficiencies to be achieved through the Community Energy Grant system where 10 homes or more are retrofitted alongside community buildings and SMEs

Cutting Emissions in Transport

Castlepollard's central location can make switching to EVs easier than you think

There are about 520 private cars in the SEC . These are mainly diesel (69%) with 27% petrol and 4% other (probably EVs). The vast majority of journeys travelled by Westmeath drivers are within the range of EV batteries, park and ride can meet the demands of nearly all the remainder of trips. A closer look at your actual driving distances just using google timeline can show you just how feasible transferring to an EV can be for you.

Removing Carbon and NOx from transport

Diesel Vehicles

These are vehicles powered by fossil fuel use (petrol of diesel). They are due to be phased out from the European market from 2035.

Diesel engines emit high levels of pollutants from significant amounts of nitrogen oxides (NOx), particulate matter (PM), and sulfur dioxide (SO2), which contribute to poor air quality. These pollutants are associated with respiratory problems, cardiovascular diseases, and other health issues.

Older diesel vehicles may lack proper emission control technologies altogether. The emissions for a diesel SUV are approximately **200 g CO_2/km**

Hydrotreated Vegetable Oil (HVO)

HVO is a type of renewable diesel fuel that is produced by hydrotreating vegetable oil. It can be used as a direct replacement for fossil diesel in diesel engines.

Emissions for HVO are said lower than those of diesel and can be used in trucks and tractors. However, it should be noted that HVO is a short term solution which will need to be replaced by other solutions in the future: from newer biofuels, to high performance EVs, to fuel cell heavy duty vehicles.

Battery Electric Vehicles (EV)

These are vehicles powered by a battery that does not include any fossil fuel use (petrol of diesel). Most new EVs have a range of 300km or more and cost from about €30,000 new. This EMP recommends **an information campaign to increase take-up** of EVs.

Emissions relating to an EV come from the carbon intensity of the local electricity supply. If the EV is charged at home from PV panels, the CO2 emissions are effectively zero

An EV can save you money AND reduce your carbon footprint

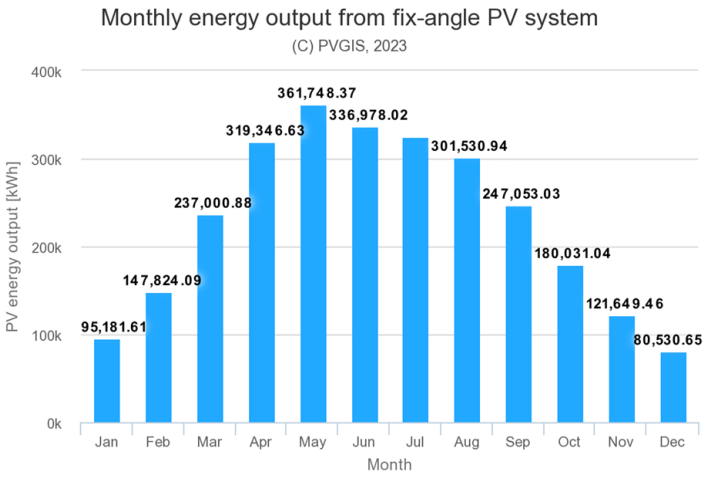
Comparing an EV costing €34,143 (with a 250km range) with a similar diesel car costing €35,785 shows that the EV is cheaper to run by €635 per year. Over a 10-year lifetime, you could save €18,036 by switching to an EV. You can compare costs and savings for a range of EVs over Diesel vehicles at this link

Can Castlepollard Power Itself?

The natural heritage and beauty of Castlepollard is something that must be protected when it comes to proposing to generate power here. It is not feasible that all the energy the area needs can be produced locally. However, there may be a case for smaller, community-led generation that suits the environment here to meet some of the energy needs renewably.
A significant proportion of a reduced electrical demand (achieved through efficiencies and retrofits) can be can be met through: **Medium Scale Community Photovoltaic (PV) and Micro-Scale PV**

A 3000 kW PV farm on 6 hectares of marginal land?

Community scale PV would be possible in certain areas of the SEC but would need positive community involvement with partnership status within the development to meet county policy and public acceptance requirements. The economics of a community scale PV system in the SEC are encouraging.
Solar resource for the area is good and would generate about be 2,754 MWh of green electricity removing 909 tCO2 from the SEC's energy system. Planning, environmental and community acceptance are critical to feasibility, but economically and technically, such a PV farm would be possible, profitable and sustainable.



It would produce electricity for a cost of approximately €60 -€90 per MWh making it competitive in the market and a viable opportunity. A community scale PV farm does not necessarily be seen as a 'money-earner' and can be seen as a means of reducing the communities carbon footprint.

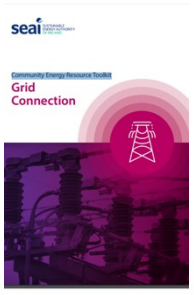
A 3 MW PV farm at a location chosen to eliminate risk to the environmental and heritage of the area would be like planting 65,000 trees around Castlepollard.

PV and Sheep?

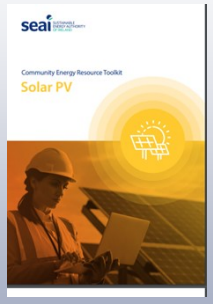
There are opportunities for businesses, community groups and farms, (for sheep farmers in particular) to lower their carbon footprint by medium scale onsite PV.
There are grid payments available for excess generation, but you will need to consume at least 20% of the power you generate.
A sheep farm typically emits 4.1 tCO2 per hectare per year. This is the same amount of CO2 as a 12kW PV system would avoid by replacing grid electricity (taking up about 0.0096 ha — 96m^2).
Sheep and PV panels can comfortably share the same space, and frequently do.

Sheep grazing around PV in Kinsale, Cork

Teagasc PV on farms guide: LINK



Community Energy Resource Toolkit: LINK



Community level PV Guide: LINK

Micro Generation PV

A domestic solar PV system consists of a number of solar panels mounted to your roof (or in your garden or adjacent field) and connected into the electrical loads within your building. Solar PV systems are rated in kilowatts (kWp). A 1kWp solar PV system would require 3 or 4 solar panels on your roof needing about 2.5m^2 of space.

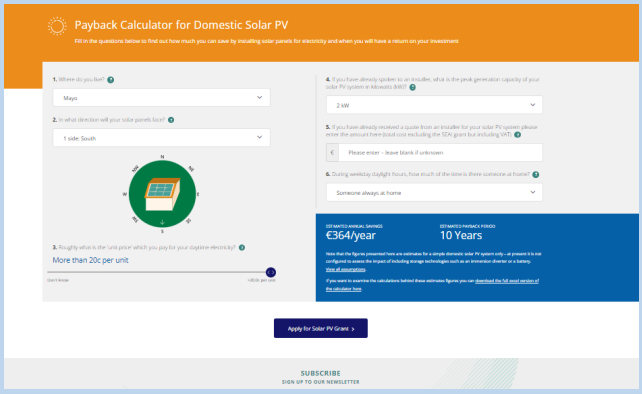
Since a consumer pays approximately €0.32 per kWh to their electricity provider, a 2.5 kWp PV panel system (if the home is occupied during the day) will save the homeowner €357 or more per year. There would also be an additional payment from the Clean Export Guarantee (CEG) Tariff (of approximately €279 per year in this case). On an installation costing €4,300 (nett of SEAI grant of €1,950) this would achieve a simple payback of 6.7 years. There is a significant grant incentive available from the SEAI for PV installation for homeowners. The full details are available at this link.

SEAI PV Grants for Homeowners

Value	Example
€900 per kWp up to 2kWp	€1800 for 2kWp solar panels
€300 for every additional kWp up to 4kWp	€2100 for 3kWp solar panels
Total Solar PV grant capped at €2400	**€2400 for 4kWp solar panels**

Any excess electricity produced can be stored in a hot water immersion tank or in a battery. It can also be used to power an electric car that is parked during the day at the home. It can also be exported from the house into the electrical network on the road outside your home.

The great additional benefit from a home installed PV system is that it reduces carbon emissions as well: in our 2.5 kW example, it would reduce carbon emissions by over 700kgs CO2, equivalent to planting 52 trees.



The SEAI has a useful Calculator that shows payback period for typical installations, customisable by county, size of system and retail price of electricity. It is available at this LINK

Economics of a 2.5 kWp System on Inishturk

System Cost (with grant)	Annual Savings	Payback Period	Lifetime** Profit
€4,300	€636/year*	6.7Years	€11,604

*It is not assumed that the homeowner will consume all the electricity. This is based on a cost of €0.32/kWh unit electricity and a price for supply to grid of €0.25 per unit electricity with half used in the home and half exported.
**A typical PV System has a 25-year lifespan. This does not include any increase in cost of electricity over the period which would increase the lifetime profitability.

Individual actions for homeowners

...some quick and easy sustainability 'wins' to save you energy and money as well as reducing carbon emissions

Step 1: Do Your Own Audit:

- Check windows, external doors, vents, floor spaces, fireplaces, and stoves with a stick of incense: and track down and eliminate draughts.
- Check insulation levels in attic, basement, walls (including the meter box), and floors.
- Check your boiler and stove; what age are they? When were they last serviced?
- Collect energy bills and scrutinise them over a year or 2.
- To save money in the short term see if you need to change your electricity supplier.

Step 2: Actions to save 36% of your energy costs and fossil fuel use:

- Turn everything off – don't leave on standby (2%)
- Use a clothes line when possible - no tumble dryer (7%)
- Wash clothes @ 30 degrees (1%)
- Turn off lights when not in a room, replace bulbs with CFLs at least, or with LEDs if possible (2%).
- Use oil to heat water – not electric immersion or electric shower (24%)

Step 3: Save energy by thinking about the way you control and use heat

- Maintain room temperature 19^{0}C (this can save up to €350 every year for each degree lower you heat the house)
- Close the curtains at dusk to keep heat in the room that would otherwise be lost through the cold windows, and you could save up to 10% of your heating costs.
- Consider fitting shelves above radiators as they redirect the warm air that rises from them back into the room.

- Ventilate your house 3 to 5 minutes, a couple of times a day, instead of opening windows a little bit all day. Shut off your heating, during ventilation. This can reduce heat loss by 16%.

- Bleed your radiators regularly. If there is air in your radiator your boiler burns longer. Always start with the lowest and end with the highest radiator.

Supports for Individual Homeowners

Categories of applicants to the SEAI Home Energy Grant

Individual Energy Upgrade Grants

Up to 80% of the cost of the upgrade for a typical family home with SEAI grants

Homeowners manage their upgrades including:
- contractor selection
- grant application
- contractor works
- pay for full cost of works and claim grants afterwards
- follow up BER

For homes built and occupied before:
- 2011 for insulation and heating controls
- 2021 for heat pumps and renewable system

One Stop Shop Service

Based on set grants per measure, this can be grant funded by SEAI 45 - 50% of the cost for a typical family home

A One Stop Shop contractor manages upgrade including:
- home energy assessment
- grant application
- project management
- upgrade to a minimum B2 BER
- contractor works
- homeowner pays for the works net of grant
- follow up BER

For homes built and occupied before:
- 2011 for insulation and heating controls
- 2011 for renewable systems

Fully Funded Energy Upgrade

For qualifying* homeowners in receipt of certain welfare benefits (see below)
All home upgrade costs covered by SEAI

Service is managed by SEAI and includes:
- home survey
- contractor selection
- contractor works
- follow up BER

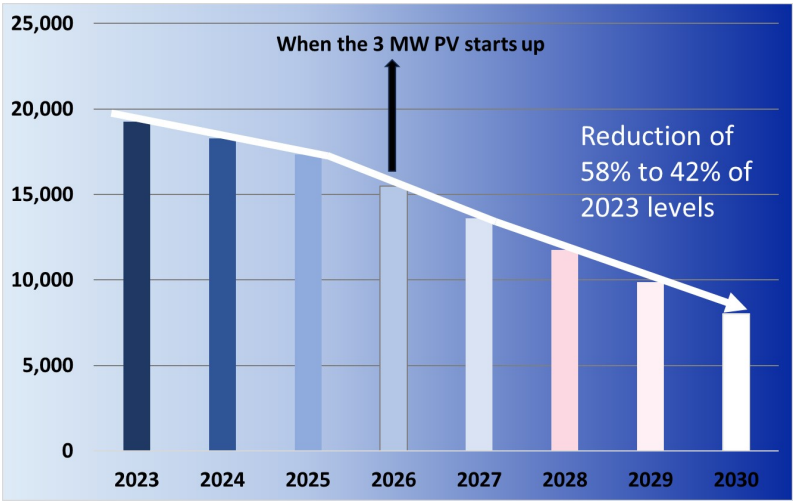
For homes built and occupied before 2006 for insulation and heating systems

*Receiving one of the following:
- Fuel Allowance
- Job Seekers Allowance
- Working Family Payment
- One-Parent Family Payment
- Domiciliary Care Allowance
- Carers Allowance
- Disability Allowance for over six months with a child under seven

2030 Sustainability strategy

Emissions Reductions Each Year in kg Co2/yr									
Priority	Action	2024	2025	2026	2027	2028	2029	2030	TOTAL/yr
1.1	Retrofit 15% of G-C3 homes each year	271	271	271	271	271	271	271	1,897
1.2	15% ND Buildings upgraded each year achieving 35% energy reduction overall	360	360	360	360	360	360	360	2,521
1.3	Information campaign to encourage GV owners to switch to EV Vans	92	92	92	92	92	92	92	645
1.4	Information campaign to encourage PSV owners to switch to EV Vans	12	12	12	12	12	12	12	87
1.5	5% replacement of FF ICE domestic cars with EVs annually	137	137	137	137	137	137	137	960
1.6	Campaign for Tractors & Machinery in SEC to switch to HVO	45	45	45	45	45	45	45	312
1.7	56 homes with 2.5kWp installations with 500 additional homes recruited each year until a target of 390	40	40	40	40	40	40	40	277
2.2	Community/Council Partnership 3MW PV electricity generation project			909	909	909	909	909	4,545
	Total Emissions Reduction tCO2	957	957	1,866	1,866	1,866	1,866	1,866	11,244

A 11,244 reduction in tonnes of CO2 is equivalent to the emissions uptake from **803,142 trees**



Under the substantiable energy strategy outlined here, emissions from Castlepollard's consumption of energy would be reduced to just 42% of 2023 levels.

carbon footprint™

The carbon measurements here looked specifically at emissions from Castlepollard's energy use and do not include emission from food consumption or air travel. You may want to look at your total footprint. A good place to start is the carbonfootprint.com tools.