



# Galway Energy Co-op SEC Energy Master Plan

**December 2023**

## Many Thanks to:

- Galway Energy Co-op SEC, especially Kieran Cunnane, David Killilea, Vincent Carragher, Vanessa Aginagalde and Philip James.
- Mel Gavin, Galway SEC Region Mentor for the SEAI SEC programme;
- Galway City Council and Damien Reddington
- The homeowners, businesses, schools and community building managers who supported and participated in the energy survey and BER assessments, and data provision for the study.
- Energy Consultants Domestic BER Assessor Seán Brady bmenergy and Ivan Sproule Non-Domestic BER Assessor



**GALWAY ENERGY CO-OPERATIVE LTD**  
**Sustainable Energy Master Plan**  
*Achieving Zero carbon energy*

Supported by



 Comhairle Cathrach na Gaillimhe  
Galway City Council

### What is the cost of energy in Galway?

Like most communities in Ireland Galway imports almost all of its energy. This is mainly in the form of fossil fuels from abroad. The city loses a significant amount of income (approximately €272,000) on energy costs 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.

**emissions** **needing**  
 399k tonnes CO<sub>2</sub> **28.5m TREES**  
**costing** **To offset**  
 €238m **Nearly ALL of it imported**

### What's Galway SEC's Energy Balance?

Energy Use by Fuel Type MWh/yr

Petrol	52,913
Diesel	254,178
Electricity	607,113
LPG	18,913
Solid Fuel	49,181
Gas	80,239
Home Heating Oil	278,850


**Heating** is the biggest use of energy —if we can reduce the amount of oil, coal and electricity we use to heat our homes and businesses by making them more comfortable and efficient, we can save money and reduce emissions.  
 The same is true of the **Electricity** that is used in businesses: there are many opportunities to be more efficient and save energy and money and also reduce emissions to create a more sustainable community


### The GEC Sustainable Energy Plan

Galway Energy Co-op Sustainable Energy Community (GEC SEC) supported and funded by the Sustainable Energy Association of Ireland, commissioned a full study of the energy uses of all sectors of Galway City West. This baseline energy survey also measured the carbon emissions produced by this energy use. Energy Co-operatives Ireland carried out onsite surveys of homes, SMEs, community, and other public buildings. The study also examined energy use in domestic and no-domestic transport. FULL REPORT AT: [energyco-ops.ie/galway-energy-co-operative-energy-master-plan](https://energyco-ops.ie/galway-energy-co-operative-energy-master-plan) including all references for this document

12 PAGE SUMMARY

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**Energy Co-operatives Ireland Ltd**  
[energyco-ops.ie](https://energyco-ops.ie)



**Galway Energy Co-operative**  
**Sustainable Energy Community**  
**Energy Master Plan**  
**July 2023**

117 PAGES, Sources, Data, etc.



**GALWAY**  
ENERGY CO-OPERATIVE LTD



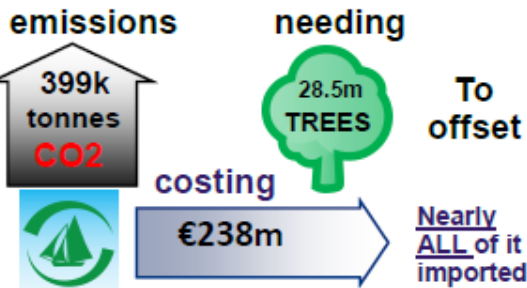
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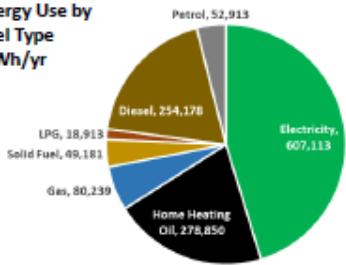
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[LINK](#)

**What's Galway SEC's Energy Balance?**

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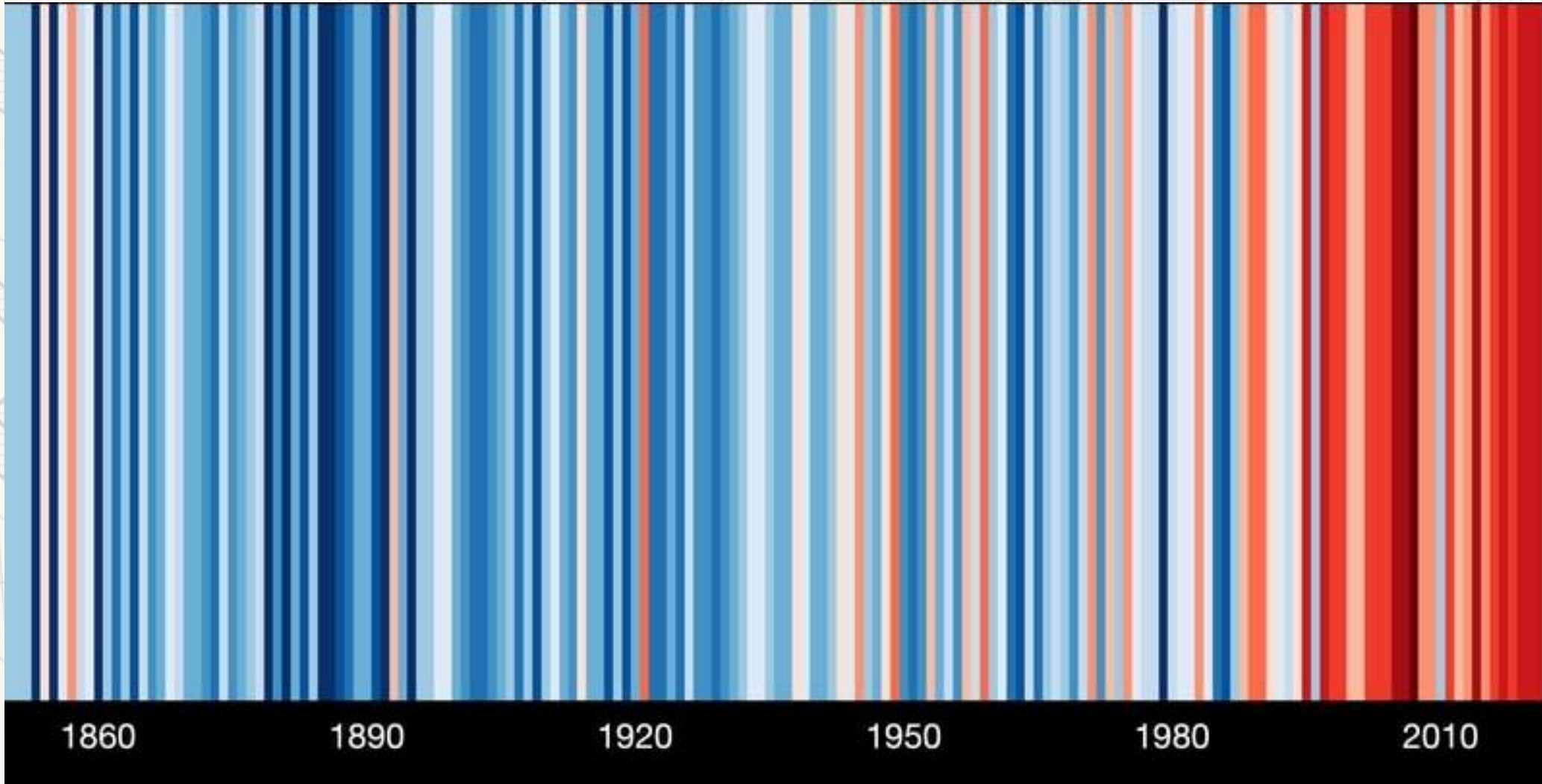
117 PAGES, Sources, Data, etc.

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**Energy Co-operatives Ireland Ltd**  
[energycos-ops.ie](http://energycos-ops.ie)

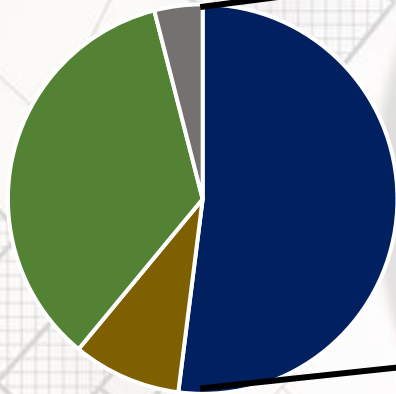
**Galway Energy Co-operative Sustainable Energy Community Energy Master Plan**  
July 2023

## Temperature Change Ireland Since 1850

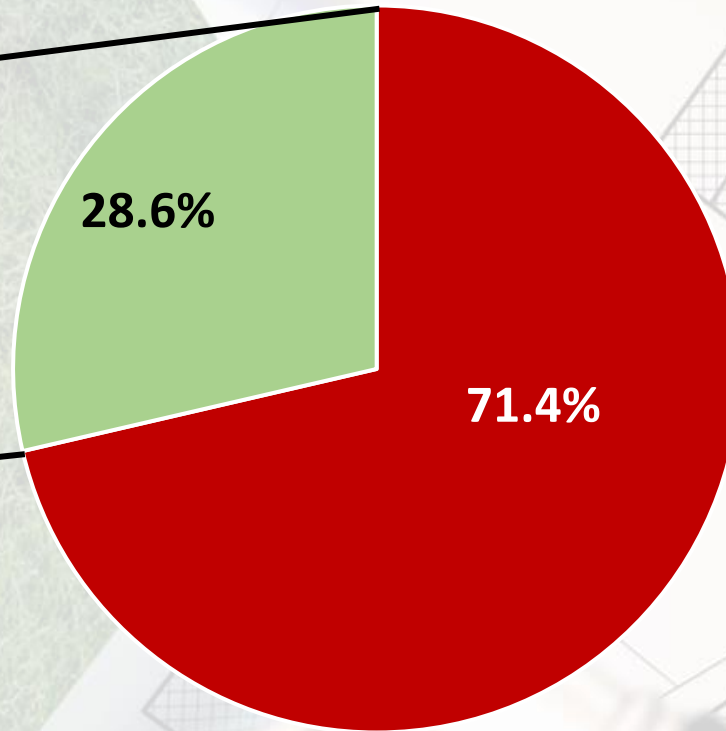


## Ireland's Energy Balance 2019

In 2019  
Renewables  
accounted  
for only  
10.0% of  
energy use



- Natural gas
- Peat
- Renewables
- Non-renewable wastes



- IMPORTED
- NATIONAL SUPPLY



# Galway Energy Co-op SEC Area



## Galway Energy Co-op SEC Area: CO2 Emissions

**399,000  
tonnes  
CO2**

**7.66 tonnes CO2  
per person for  
energy  
(excludes food,  
waste and air  
travel)**

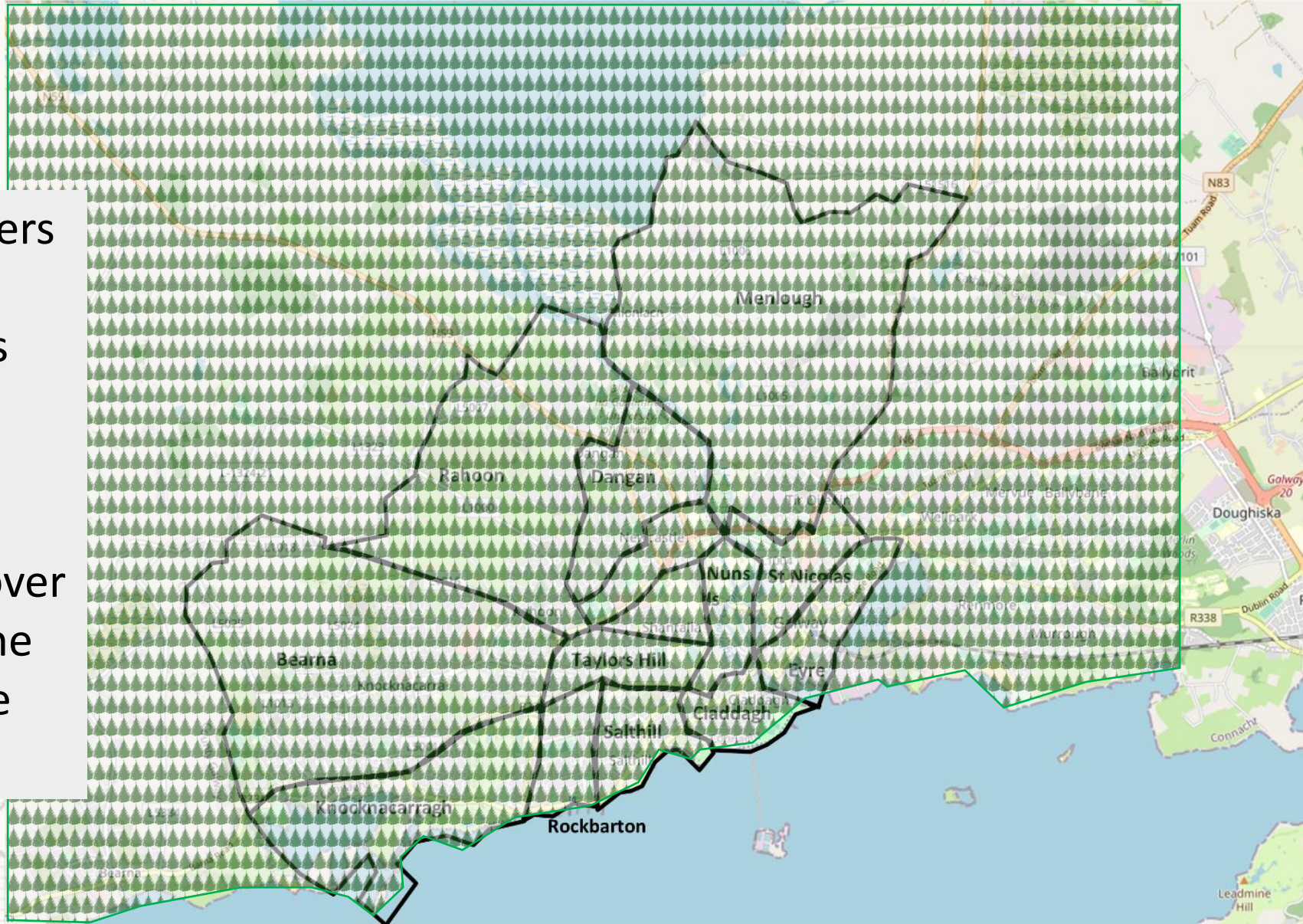
**Would need 28.5  
million trees to offset**

**CO2**



28 million conifers  
would need  
11,400 hectares  
land.

At 114 km<sup>2</sup>  
This would be over  
**THREE TIMES** the  
total area of the  
GEC SEC



## EMP shows how to reduce Carbon Emissions

30% Reduction of 166,000 tonnes CO<sub>2</sub> by 2030  
To 233,000 tonnes CO<sub>2</sub>  
And a similar reduction in energy costs

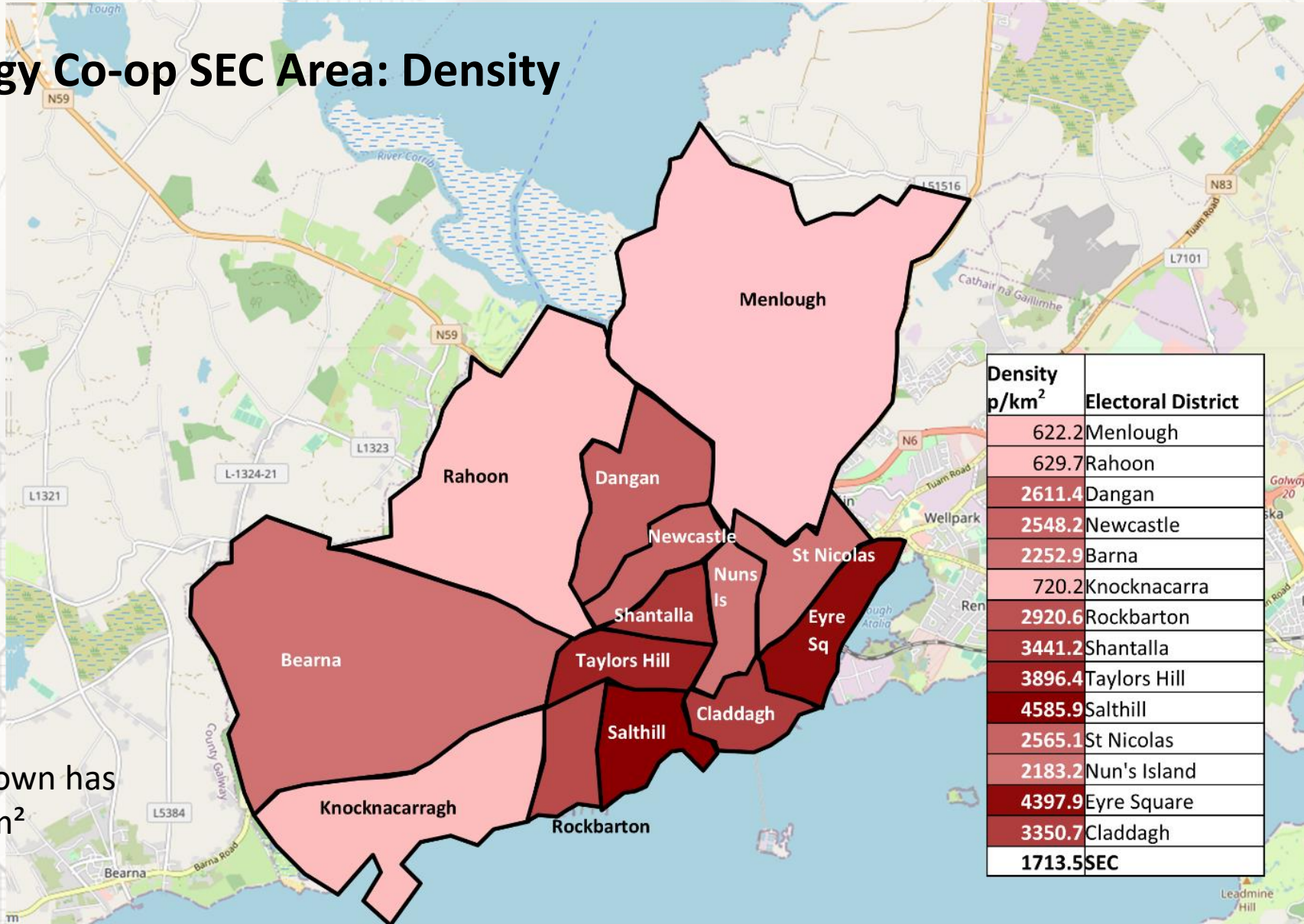
Like planting 12 million trees

**CO<sub>2</sub>**

## Galway Energy Co-op SEC Area: EMP Outline

- Energy Use Data Collection (Baseline Energy Use Study)
- Identify Energy Saving Opportunities homes, business and community
- Provide 'Registry of Opportunities' (RoO) for energy savings and fossil fuel replacement
  - Individual Homeowners
  - SMEs
  - Community Organisations
- Collective Community Projects

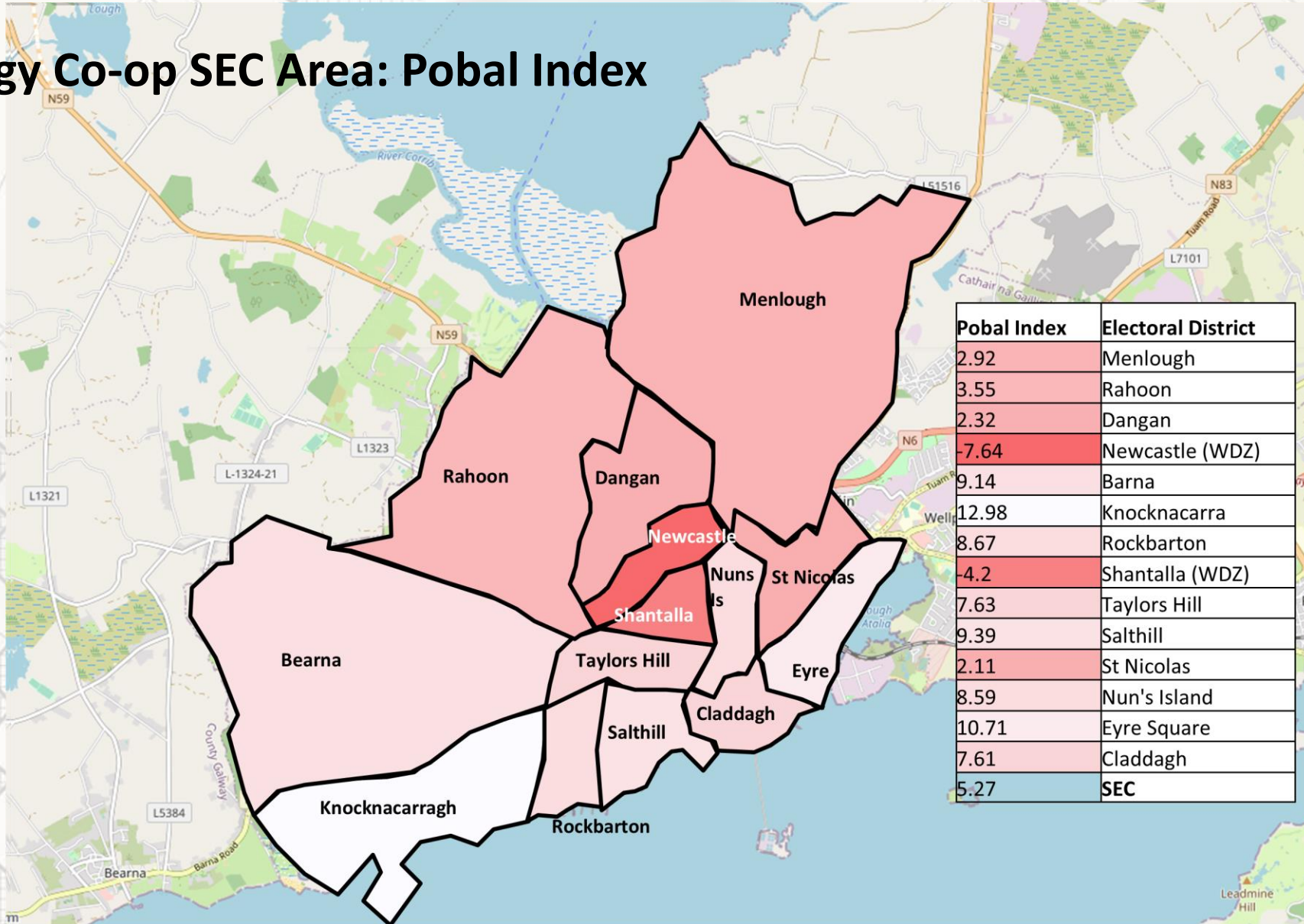
## Galway Energy Co-op SEC Area: Density



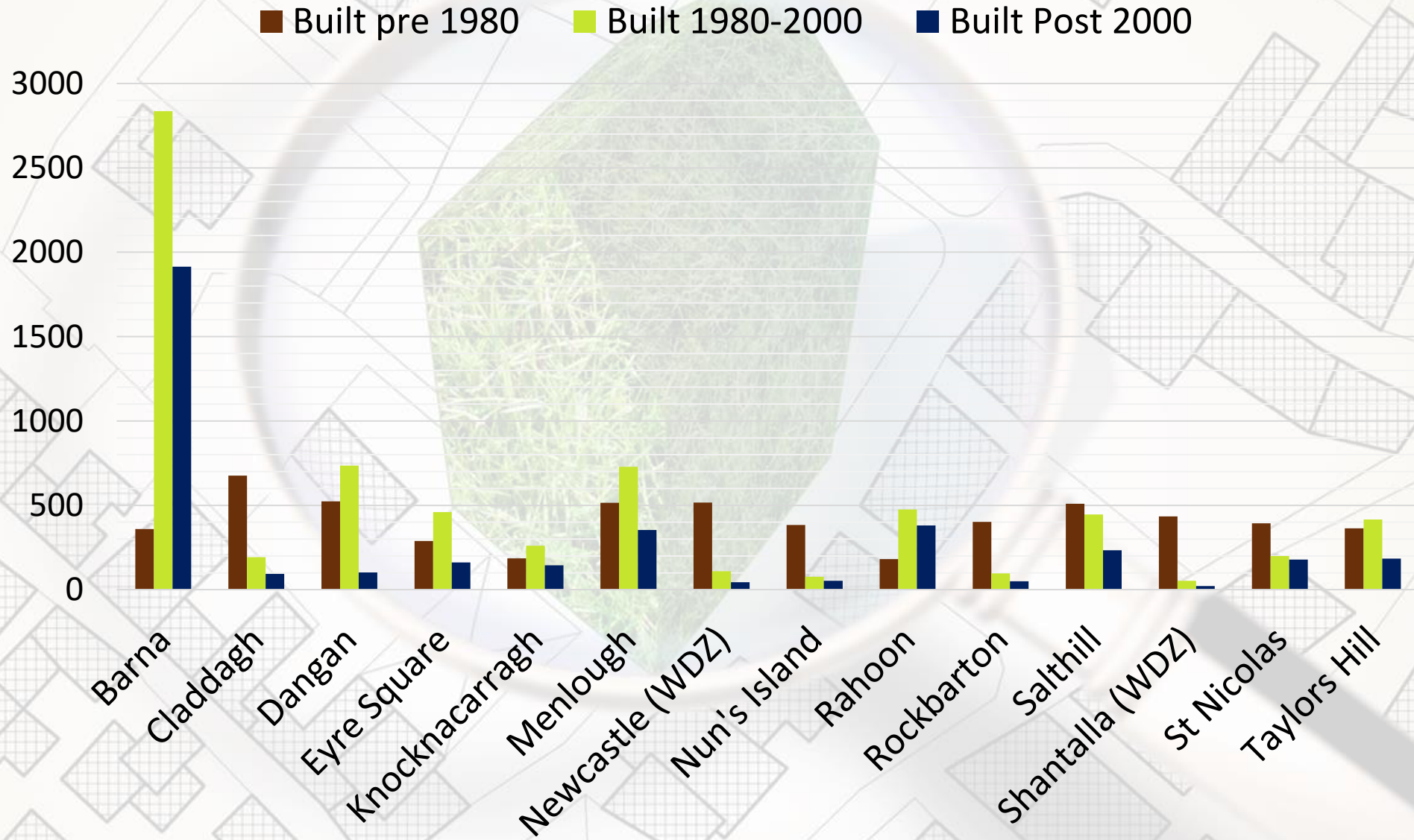
Dún Laoghaire Rathdown has a density of 1,850/km<sup>2</sup>



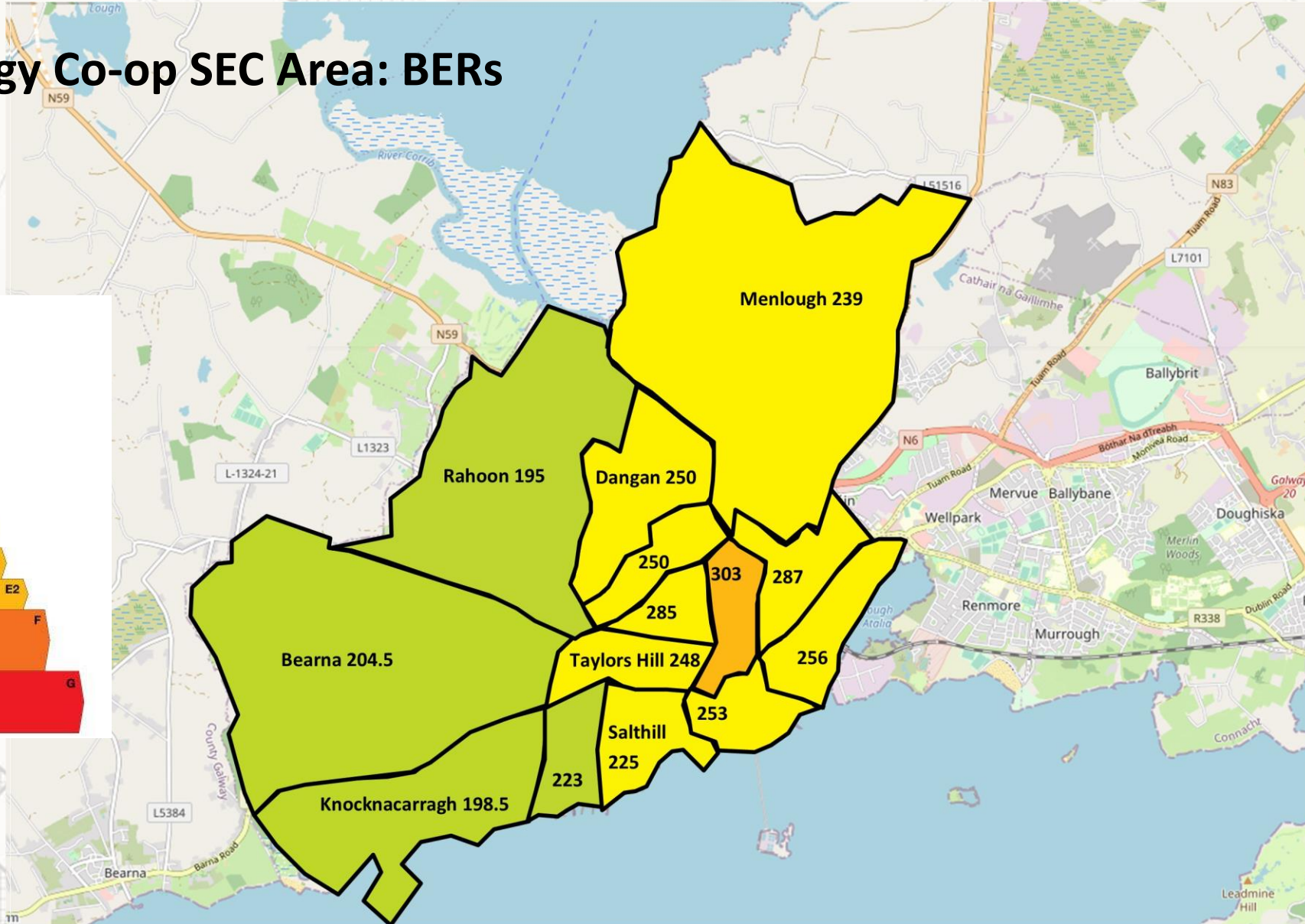
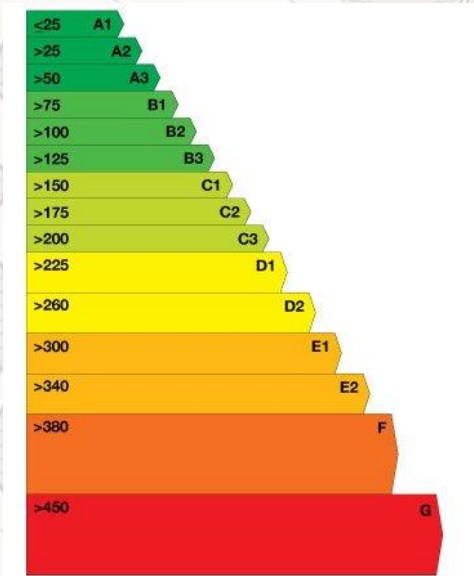
## Galway Energy Co-op SEC Area: Pobal Index



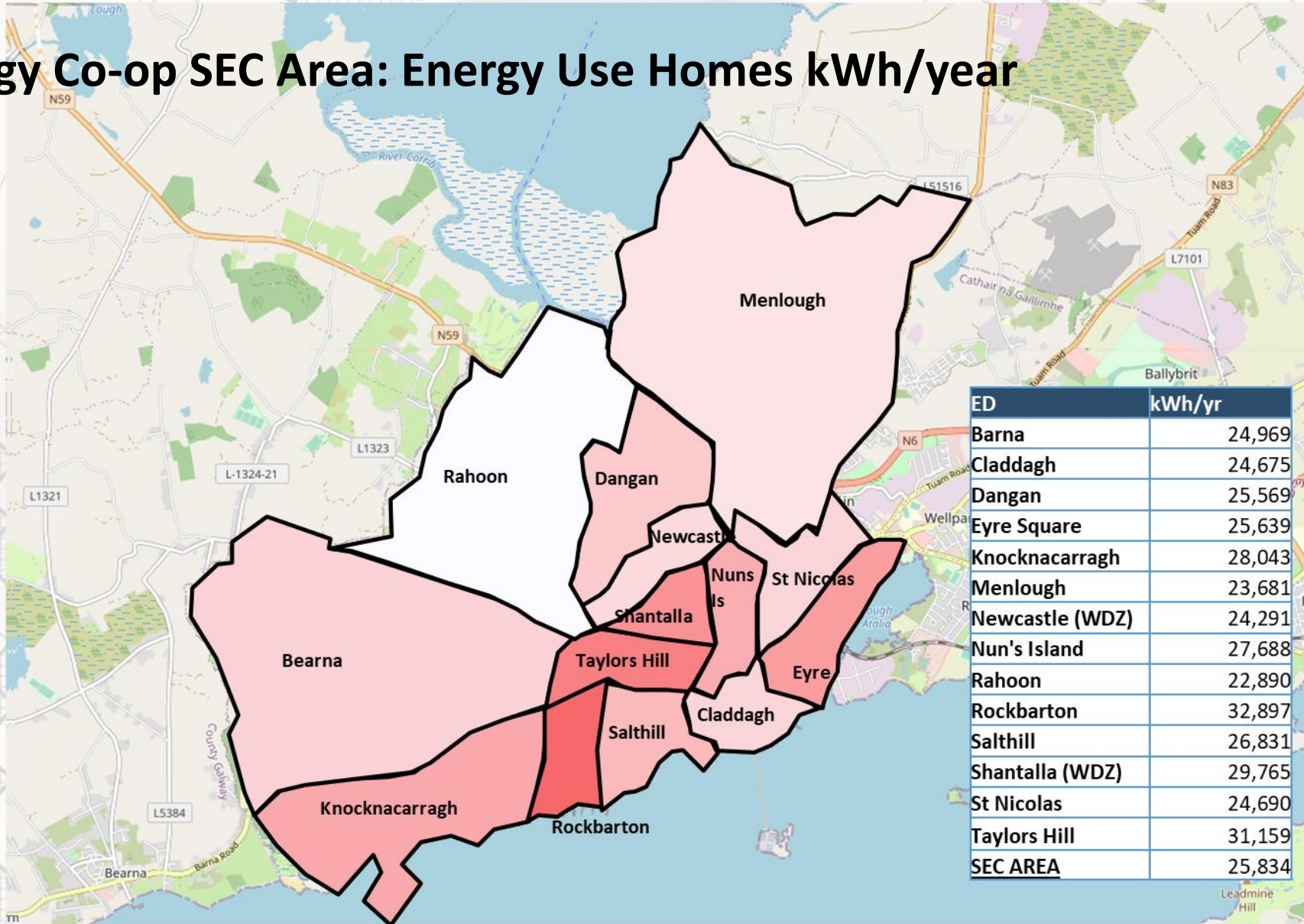
## Age of Homes



# Galway Energy Co-op SEC Area: BERs

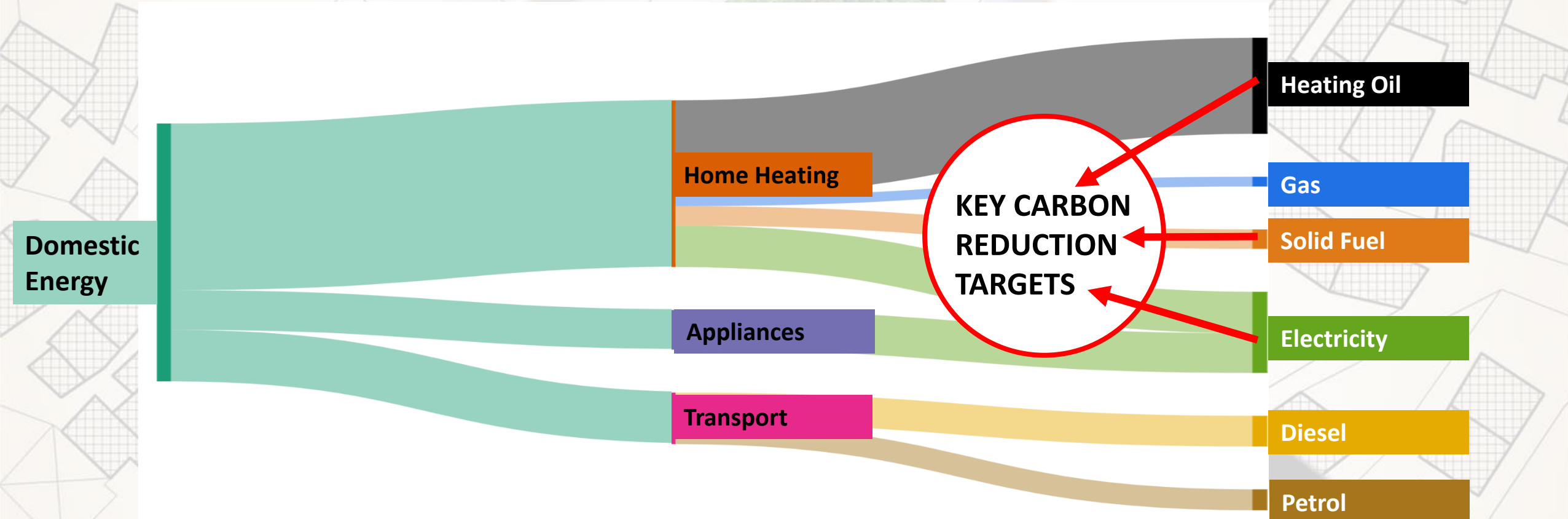


## Galway Energy Co-op SEC Area: Energy Use Homes kWh/year

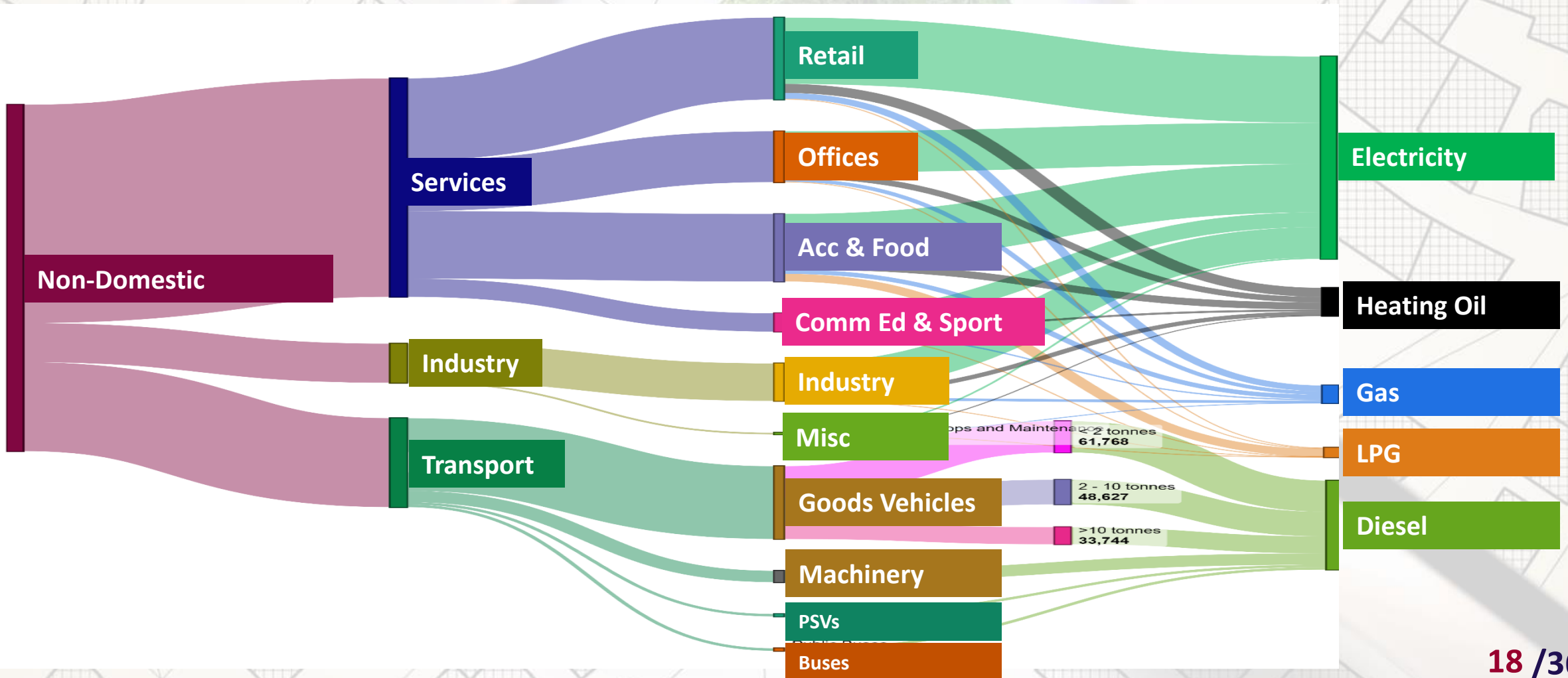




## Galway Energy Co-op SEC Area: Domestic Fuel



## Galway Energy Co-op SEC Area: Non-Domestic Fuel



## Home Energy Upgrades

# ‘Fabric First’: Upgrade Building before installing new plant

**Air Tightness**  
**Insulation**  
**Electrify**  
**Generate**



## Home Energy Upgrades

### Sample Galway SEC Home: Single storey 1990's Detached Dwelling, cavity block



Photo for illustration only

CURRENT BER	F
Energy 'Efficiency' (kWh/m <sup>2</sup> /yr)	394.68
CO <sub>2</sub> kg/yr	11,852
Heat Loss Indicator (lower the better)	4.97
<b><u>Energy Cost yr</u></b>	<b><u>€6,410 (€3,205)</u></b>

NOTE: BER Assessments are not based on user behaviour, rather the energy required to heat to normal levels (~20C). The typical actual energy use in an F-rated home is approximately 50% the rated usage.

## Home Energy Upgrades

### Sample Galway SEC Home: Single storey 1990's Detached Dwelling, cavity block



Photo for illustration only

<b>Windows</b>	Upgrade Existing Windows to Achieve Minimum U-Value of $\leq 0.73$ W/m <sup>2</sup> K	E2
<b>External Insulation</b>	Upgrade Original Walls to Achieve Minimum U-Value of $\leq 0.20$ W/ m <sup>2</sup> /K	D2
<b>Internal Insulation</b>	Install 400mm Insulation on Flat Ceiling	D1
<b>Airtightness</b>	Improve Building Airtightness to Achieve $\leq 5$ m <sup>3</sup> /hr/m <sup>2</sup> & Block Existing Chimney	C3
<b>Heating System</b>	Install Air To Water Heat Pump (HP) - Upgrade Heating Controls & Hot Water to Full Time & Temperature Control	B1
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## Home Energy Upgrades



Photo for illustration only

<b>Electrical</b>	Add 6 PV Panels to South facing roof 2kW	<b>A2</b>
<b>Total Cost Savings</b>	€5,339-€2,134	
<b>Total Carbon Savings</b>	9,660 kgs	<b>690 Trees</b>
<b>Est Cost (nett grant)</b>	~€34,785.80	
<b>Est Payback</b>	6.5 – 16 yrs	

- 10 Galway examples Available at [energyco-ops.ie/resources/energy-audits-10-examples-from-galway-county/](https://energyco-ops.ie/resources/energy-audits-10-examples-from-galway-county/)

Current BER	House Description – Year – Construction Type	Costs	Floor area m2	Cost/m2
C2	Detached Dormer Bungalow – 2003 - Unknown wall construction	€58,864	235	€250.49
C2	Detached Home – 2002 –Cavity Block	€59,747	238	€251.04
D1	Detached House - 1970 - Cavity wall construction	€74,058	239	€309.87
C3	Detached House - 1999 - Timber frame construction	€74,449	214	€347.89
C2	Semi-Detached 2-Storey Dwelling– 1985 – Cavity Block	€29,875	82	€364.34
D1	Detached House - 1990 - Cavity wall construction	€51,584	138	€373.80
C3	Detached Dwelling– 1978 – Cavity Block	€76,905	200	€384.53
C3	Detached 2-Storey Dwelling– 1991 – Cavity Block	€124,024	319	€389.04
C1	Semi Detached Home – 1991 – Cavity Block	€63,610	140	€454.36
F	Detached Home – 2002 –Cavity Block	€64,785	117	€553.72
D2	Detached Home – 1973 –Cavity Block	€98,378	171	€575.31
E2	Detached Dwelling– 1850 – Stone	€116,711	201	€579.47
E2	Semi Detached Home – 1940 – Mass Concrete	€58,728	100	€587.29
D2	Semi Detached Home – 1990	€78,915	133	€593.35
E1	Mid Terraced Dwelling – 1932 –Cavity Block	€63,877	103	€620.17
D1	Mid Terrace Dwelling – 1973 – Cavity Block	€57,273	90	€636.37
E2	Detached Dwelling – 1976 – Unknown	€105,018	153	€686.40
C3	End of Terrace – 1984 - Unknown wall construction	€62,566	80	€782.08
E2	End of Terrace Dwelling – 1950 – Mass Concrete	€61,337	78	€789.62
	<b>Median</b>			<b>€553.72</b>

## Micro PV in the home

A 2 kW solar PV system would require 6 or 7 solar panels on your roof (about 10m<sup>2</sup>)

A roof mounted 2kWp PV system on a south facing roof in Shantalla will produce 1,815 kWh per year.

If a consumer pays €0.43 per kWh to their electricity provider, a 2.5 kW PV system (if half the energy is consumed by the home-owner) will save the homeowner **€393 per year**.

With a typical payment for each kWh (**about €190**) sold to the grid by the homeowner reclaimable from your energy provider

There are grants up to a maximum of €2,400 through the SEAI

Payback would be: €5,000 Cost - €1,800 (grant)

€393 savings + €190 rebate

= 5.5 years



## Non-domestic Sector: PV at Scale

Current carbon intensity of Ireland's grid electricity is 345g CO<sub>2</sub>/kWh. PV generation can help reduce this locally.

Limited Sites, but there are some.

Community scale PV would require positive community acceptance and partnership.

Through Galway Energy Co-operative there opportunity for organised community involvement.

5MW PV requires approx 10 hectares (2a)

A proximity of less than 2km to 38kV substation with open capacity is advantageous.



## Non-domestic Sector: PV at Scale

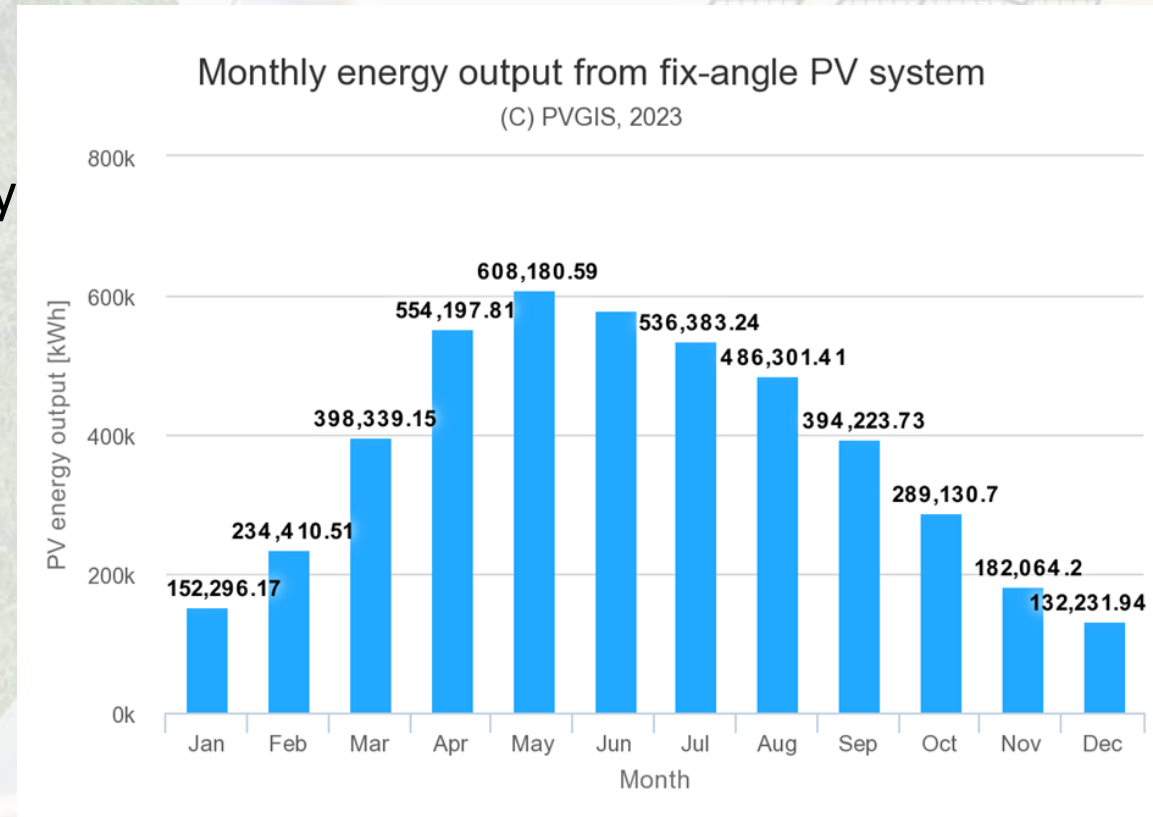
The total production from a 5MW PV project would be 4,548 MWh. This would have the effect of removing **1,500 tCO<sub>2</sub> annually** from the SEC's energy system.

Projected capital cost of €8.8m and OPEX of €3m for the 30-year lifespan of the project.

LCOE (breakeven price of power) would be €125/MWh making it an economically viable project.

If a community initiative, the project is likely to qualify for support from the upcoming Small-Scale Generation Scheme (SSGS).

The SEAI has produced a very helpful guide explaining how to carry through Community Energy PV projects



## Non-domestic Sector: Small hydroelectric projects



Fully realised these micro-hydro installations could avoid 2,380 tCO<sub>2</sub> emissions.

- Proven resource of renewable energy in Ireland and elsewhere. The river Corrib runs into Galway Bay through the SEC. Historically there were a number of mills on the river banks.
- Designed to protect fish-life through screening and so would not effect biodiversity or salmon and other valuable angling tourism resources.
- There is a considerable resource across eight sites on the Corrib in the SEC area. Despite the generally low headraces <5m, the flow-rates are extremely strong. There is a calculated hydro-electric resource of 6,265 MWh per year across the sites.

## Non-domestic Sector: Small hydroelectric projects, skills opportunity

Site	1	2	3	4	5	6	7	8	ALL
HEAD	2.5	2.5	3.9	2.7	3	2.6	2.6	5.8	-
POWER kWp	117	100	465	35	31	33	33	330	1144
OUTPUT MWh/yr	643	549	2,554	192	153	181	181	1,812	6,265
tCO2 avoided per yr	217	186	863	65	52	61	61	613	2118

In Ireland there are 560 sites capable of exporting electricity to the Grid (i.e >10kW power). The EPA estimated that these sites could generate renewable energy which would help avoid over 50,000 tonnes of carbon emissions a year.

A community-based organisation with skills and expertise in micro hydroelectricity projects could have a very strong business model that could be applied to the 560 sites identified by the EPA above. The GEC SEC includes in its membership experts on hydro-electricity – there is therefore a clear opportunity for the SEC to pursue medium scale hydro projects in the Eglinton Canal area.

## Non-domestic Sector

Most SMEs and Community Buildings can save approximately 30% of energy costs and emissions relatively easily  
Grants available for audits and recommended actions  
Community grants available for schools, clubs, etc

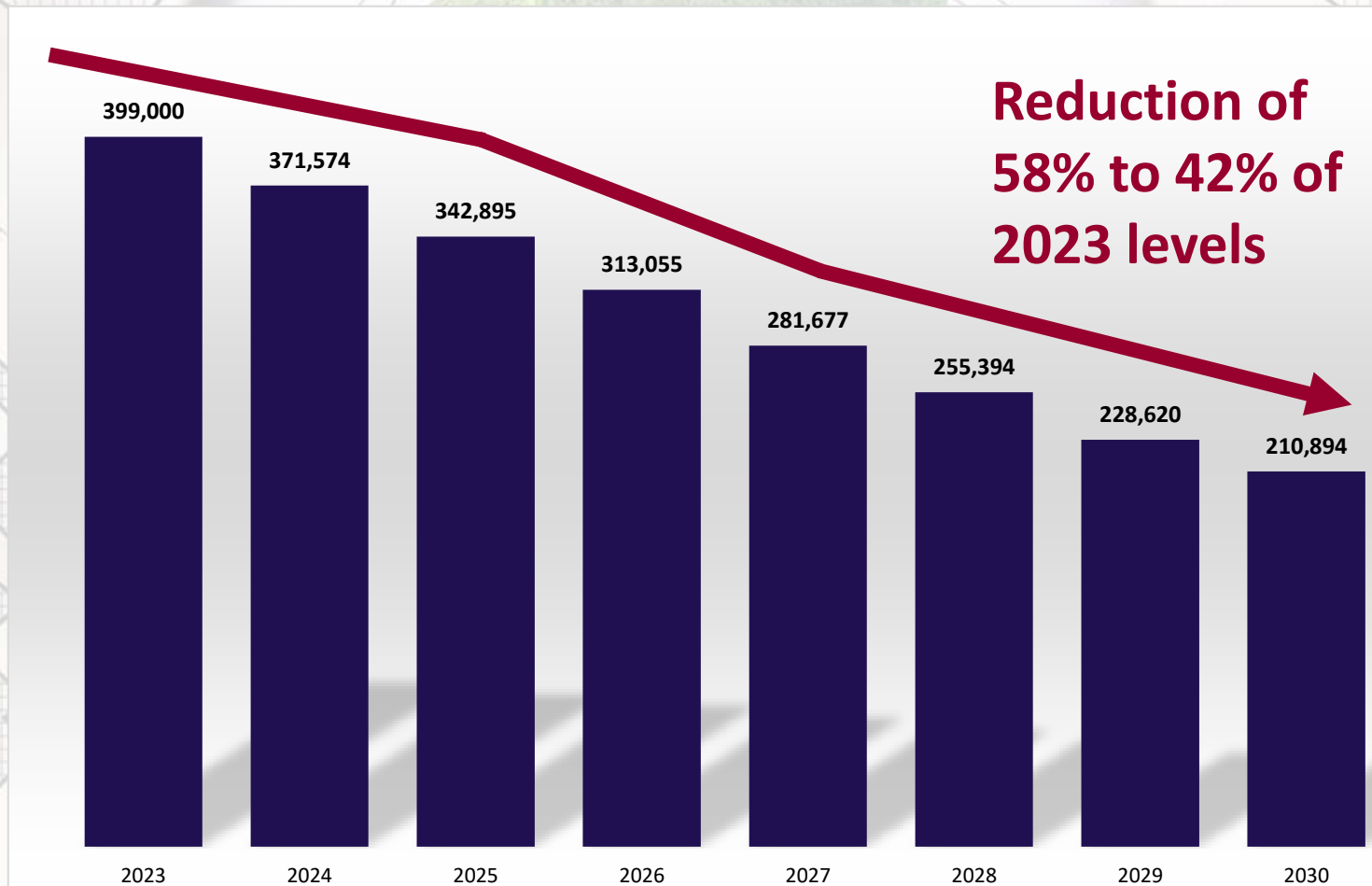
## Non-domestic Sector: our surveyed premises

Type	m2	Savings kWh	Cost Savings	Cost of measures €	Payback (yrs)	CO2 reduction kg
Workshop	232	7,589	€2,542	€13,150	5.2	2,639
Hotel	9,700	2,012,819	€267,230	€940,000	3.5	319,477
Café	65	6,385	€2,084	€12,550	6.0	2,376
Shop	136	4,297	€2,132	€3,750	1.8	4,297
Restaurant	735	53,926	€20,111	€51,900	2.6	18,755
Sports Club	675	18,947	€3,489	€34,900	10.0	4,849
Sports Club	252	15,963	€2,737	€26,950	9.8	4,548
Shop	8,502	106,984	€36,925	€62,500	1.7	37,209
School	874	54,145	€7,341	€116,800	15.9	15,167

## GEC SEC Strategy 2030

Emissions Reductions Each Year in kg Co2/yr								
Action	2024	2025	2026	2027	2028	2029	2030	TOTAL/yr
Retrofit 15% of G-C3 homes each year	15,961	15,961		15,961	15,961	15,961	10,640	90,443
15% ND Buildings upgraded each year achieving >30% energy reduction overall	8,000	8,000	8,000	8,000	8,000	8,000	5,333	53,330
Active Travel Campaign to switch 330 commuters in Barna and Knocknacarragh to Cycling per year	67	67	67					202
Information campaign to encourage GV owners to switch to EV Vans	1,020	2,040	3,060	4,080				10,201
5% replacement of FF ICE domestic cars with EVs annually	104	104	104	104	104	104	69	694
Campaign for Tractors & Machinery in SEC to switch to HVO	1,779	1,779						3,557
500 homes with 2kWp installations with 500 additional homes recruited each year until a target of 3,322	275	275	275	275	275	275	183	1,834
Encourage 50 PSVs to transfer to EV per year	221	221	221	221				883
Community/Council Partnership 5MW PV electricity generation project			1,500	1,500	1,500	1,500	1,500	1,500
50% Replacement of Diesel Bus by Hybrid Bus on Private Route		48	48					96
Micro-Hydro Scheme 1		186						186
25% of Bus Éireann Buses from Hybrid to EV			322	322	322	322		1,289
Micro-Hydro Schemes 2 per year			282	915	122	612		1,932
<b>Total Emissions Reduction tCO2</b>	<b>27,426</b>	<b>28,679</b>	<b>13,879</b>	<b>31,377</b>	<b>26,284</b>	<b>26,774</b>	<b>17,726</b>	<b>166,146</b>

## Strategy 2023-2030 CO2 emissions decline





## Homeowner Grants: Fully Funded

### Those who receive the following welfare payments:

- Fuel Allowance as part of the National Fuel Scheme.
- Job Seekers Allowance for over six months and have a child under seven years of age
- Working Family Payment
- One-Parent Family Payment
- Domiciliary Care Allowance
- Carers Allowance and live with the person you are caring for
- Disability Allowance for over six months and have a child under seven years of age

Apply to SEAI online

SEAI surveyor surveys your home to make upgrade recommendations.

A contractor appointed by SEAI to carry out the upgrade works.

### What is included

Attic insulation

Cavity wall insulation

External wall insulation

Internal wall insulation

Secondary work such as lagging jackets, draught proofing and energy efficient lighting

New heating systems and windows are occasionally recommended

Must own the home which was built and occupied before 2006

**Normal waiting times, from application to completion of works, are between 18 and 24 months. Current waiting times vary due to significant demand.**

## Homeowner Grants: 'One Stop Shop'

*'A complete home energy upgrade solution'*

### Who this is for

For homeowners and private landlords who want:

- multiple energy upgrades
- to upgrade to a minimum B2 BER
- a fully managed solution including grant applications
- to pay for the works net of eligible grant

### Criteria for homes

Homes built and occupied before:

- 2011 for insulation and heating controls
- 2011 for renewable systems
- All homes must complete a minimum level of energy upgrades and achieve a **minimum BER rating of B2**

### Mid Terrace



Average works cost

€51,826

Average grant amount

€19,015

Average cost to homeowner

€32,811

Average BER improvement

E1 > A3

Typical upgrades:

- Heat pump
- Windows and doors
- Wall insulation
- Ceiling insulation
- Ventilation

### Semi-D/End Terrace



Average works cost

€60,292

Average grant amount

€21,694

Average cost to homeowner

€38,598

Average BER improvement

E1 > A2

Typical upgrades:

- Heat pump
- Windows and doors
- Wall insulation
- Ceiling insulation
- Solar panels
- Ventilation

### What is included

home energy assessment  
grant application  
project management  
contractor works  
follow up BER

## Homeowner Grants: Individual Energy Upgrade

Manage your own home energy upgrades.

Gives the flexibility to take a step-by-step approach, carrying out different upgrades over time and to suit your budget.

Select a SEAI registered contractor and apply for a grant through an online application system

Grant is paid directly to the homeowner, once works have been completed and grant paperwork submitted.

- Attic Insulation (€800-€1,500)
- Wall (internal or external) from €800 to €8000
- Heating controls (up to €700)
- Heat Pump (€4,500-€6,500)
- Solar PV (from €900 per kWp up to 2kWp max of €2400 for 4kW)

**The house would need a HLI of <2 to justify a heat pump**

Terraced House	Grant	Typical Cost
Heat Pump	€6,500	€13,500
Heating Controls	€700	included
Attic insulation	€1,200	€1,200
Cavity wall insulation	€800	€1,600
Internal Insulation (Dry Lining)	€2,000	€4,000
External Wall Insulation (Wrapped)	€3,500	€13,550
Solar PV	€1800 for 2kWp solar panels	€5,000
<b>Total Possible</b>	<b>€16,500</b>	<b>€38,850</b>

## Homeowner Grants: Individual Energy Upgrade

	Individual Energy Upgrades	One Stop Shop Service	Fully Funded Energy Upgrade
Home energy assessment	no	✓	✓
Project management	no	✓	no
Wall and roof insulation	✓	✓	✓
Floor insulation	no	✓	no
Windows	no	✓	✓
Heating controls	✓	✓	✓
Heat pump	✓	✓	✓
Solar water heating	✓	✓	no
Solar electricity	✓	✓	no
Ventilation	no	✓	✓
BER assessment	✓	✓	✓

## Many Thanks

Full document at:

<https://www.energyco-ops.ie/galway-energy-co-operative-energy-master-plan/>

Contact

Lúgh ó Braonáin

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