

Joyce Country SEC Baseline Energy Use Study Summary



Produced by



On Behalf Of



CDS Teo - Comharchumann
Dhúiche Sheoigheach Teo

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Introduction: understanding Joyce Country's energy future

The Joyce Country Sustainable Energy Community *Baseline Energy Use Study* establishes how energy is consumed, what fuels are used, how much energy costs and the associated carbon emissions across this rural community in Counties Galway and Mayo.

This study provides a starting point for the SEC's transition to a more sustainable, affordable and secure energy system. Its findings will inform a separate Register of Opportunities (RoO), identifying practical measures to reduce energy demand, improve efficiency and expand renewable energy generation.

We provide the evidence needed to develop a realistic, community-led pathway towards lower energy use, lower emissions and greater use of renewable energy.

Joyce Country's energy transition should combine demand reduction, efficiency improvements and locally appropriate renewable generation. The baseline establishes where the community stands; the Register of Opportunities will determine which interventions are practical, affordable and capable of delivering measurable benefits.

This document is a summary of the full Baseline Energy Use Study which was presented to the commissioning body Comharchumann Dhúiche Sheoigheach Teo.

Summary Findings

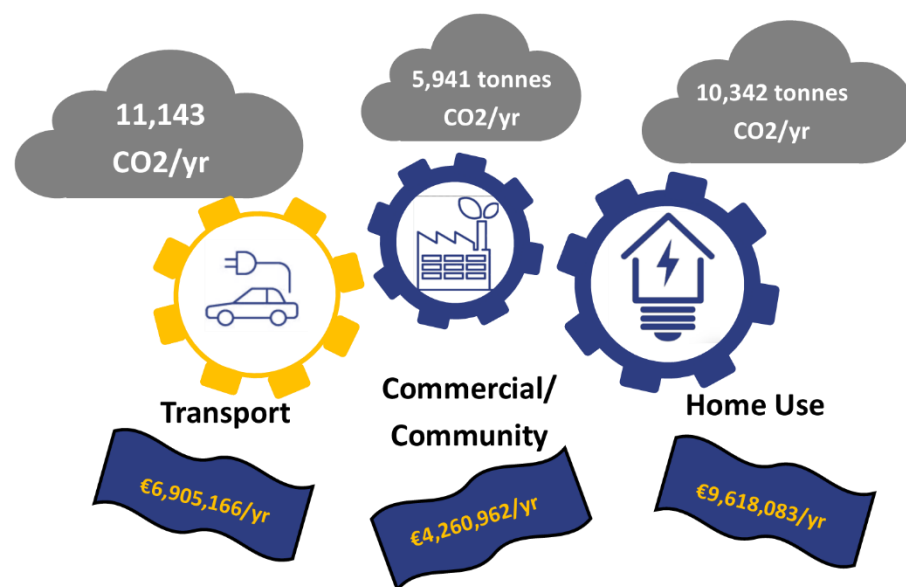


Figure 1: Energy Cost and Emissions Summary Graphic¹

- The Joyce Country area uses 110,211 MWh of energy across all sectors, of which 39.5% (43,541 MWh) is consumed in the home for heating, lighting and appliances.
- The estimated cost of heat *demand*² for households in the SEC is €8,587 on average on home energy approximately **16.7% of their disposable income³ (see comment box next page below)**. When we include transport costs this rises to €11,265 per year (21.9%).
- Direct⁴ fossil fuel use of 34,466,902 MWh makes up 69.4% of all energy sources.
- At present only an estimated 1.43% of energy comes from renewable sources *within* the SEC.

¹ These figures exclude the energy use of three companies/users. The rationale for this is explained in Section **Error! Reference source not found.**

² Throughout this document we refer to demand rather than actual use/spend. This is based on the SEAI and CSO methodologies for measuring a home or building's energy demand according to objective criteria. Real spends will vary, but we have used the best methodologies possible to give the most accurate picture of demand, use and costs.

³ According to the CSO in 2022 the mean household income for the four Joyce Country Electoral districts after tax was €51,238 - <https://data.cso.ie/table/GPIIA01>. Individual households, for example those in fuel poverty, may spend less than this figure – but they are, as a result, not heating their homes to recommended levels.

⁴ This excludes electricity: 40.2% of electricity generation in Ireland in 2024, and this is ever increasing ([CSO Environmental Indicators Ireland 2025 – Key Findings](#))



That there are a higher number of E, F and G rated homes in the SEC only partly explains that high heating spend in the home. The current BER ratings in the SEC indicates home energy performance markedly lower than the national average. Heating and lighting these homes to a comfortable temperature would cost in excess of €8,000 annually. In practice, it is more likely that these homes are not being heated adequately resulting in discomfort and poorer health.

Table 1: Joyce Country SEC Primary Energy Baseline (kWh)

Sector	Electricity	Fossil Fuel	Renewable	Total
Residential (in the home)	12,422,127	30,190,389	927,987	43,540,503
Non-residential	14,547,397	9,443,274	651,626	24,642,297
Transport	-	42,028,269	-	42,028,269
Total Energy	26,969,525	81,661,933	1,579,613	110,211,070

Homeowners in The Joyce Country:

- Spend more than €12.6m each year on energy between heating, appliances and transport fuel in total.

⁵ Calculations in Section **Error! Reference source not found.**

- results in harmful environmental impacts through the associated carbon emissions, estimated at 14,769 tCO₂. Offsetting these emissions would require the annual carbon sequestration capacity of approximately 1,054,928 mature trees⁵.

In the **non-domestic sector**⁶, as shown in **Error! Reference source not found.** below, The Joyce Country SEC:

- spends €8,167,229 on energy and,
- produces 12,208 tCO₂ in emissions

When both domestic and non-domestic total energy-related emissions are combined, the total energy related emissions amounts to 26,977 tCO₂ which is 8.2 tCO₂ per person.

⁶ We explain below in Section **Error! Reference source not found.** that we exclude three very large energy users whose energy figures would skew the baseline in such a way as to be unhelpful to proposing community scale sustainability interventions



Considering that the sustainable global limit is just 2.3 tCO₂ per person, it is evident that there are both major opportunities and an urgent sustainability need for carbon reduction strategies and joint community initiatives within the SEC.

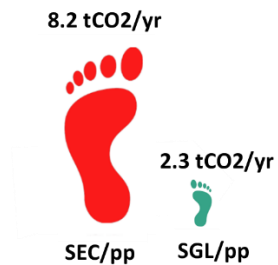


Figure 2: SEC v Sustainable Global Limit (SGL) CO₂ emissions per person per year⁷

To address this, the commissioned Register of Opportunities (RoO) (to be published) will look at identifying ways to tackle energy waste and high CO₂ levels while uncovering paths for cost savings and local renewable energy production. These solutions will be designed through a partnership between the report's authors and the local community.

⁷ <https://orca.cardiff.ac.uk/id/eprint/138487/1/EGR20ch6.pdf>

Context

The Joyce Country area covers approximately 199 km² between Lough Mask and Lough Corrib, encompassing villages including Clonbur, Cong and Cross. It has a population of 3,285 and a low overall population density of 16.4 people per km². Its dispersed settlements, detached houses, rural economy and dependence on private transport create particular energy challenges.

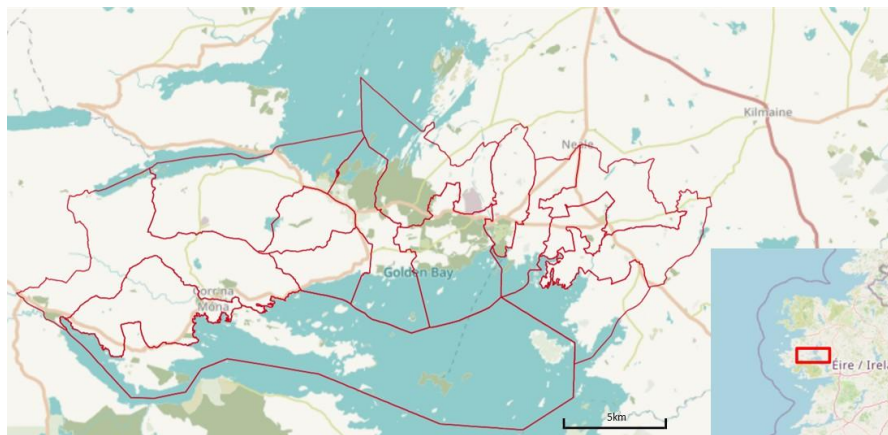


Figure 3: The Joyce Country SEC Area with CSO Small Areas Outlined in Red

The report combines local building and geographical surveys with Census, SEAI and other statistical data. Where direct local measurements were unavailable, estimates and national or county-

level data were used. The baseline is therefore a reasoned estimate of energy demand, rather than a comprehensive metering exercise.

The overall energy picture

We estimate total energy use across the sectors included in its aggregated baseline at approximately 110,211 MWh per year. Of this, around 43,541 MWh is attributed to domestic energy use in homes, 24,642 MWh to non-residential activity in the aggregated baseline, and 42,028 MWh to transport.

The report's fuel breakdown highlights the continuing dominance of fossil fuels:

- Diesel: 38,117 MWh, or 34.6%.
- Heating oil: 31,215 MWh, or 28.3%.
- Electricity: 26,970 MWh, or 24.5%.
- Gas: 7,172 MWh, or 6.5%.
- Petrol: 3,911 MWh, or 3.5%.
- Renewable energy: approximately 1,580 MWh, or 1.4%.
- Solid fuels: 1,247 MWh, or 1.1%.

These figures illustrate the scale of the challenge. Diesel and heating oil together account for almost two-thirds of the aggregated energy baseline, while the recorded renewable contribution remains small.

Domestic and non-domestic energy-related emissions combined amount to approximately 26,977 tonnes of CO₂ annually, equivalent to 8.2 tonnes per person. It compares this with a sustainable global limit of 2.3 tonnes per person per year.

These results establish the case for coordinated community action, rather than relying solely on individual households or businesses to make changes independently.

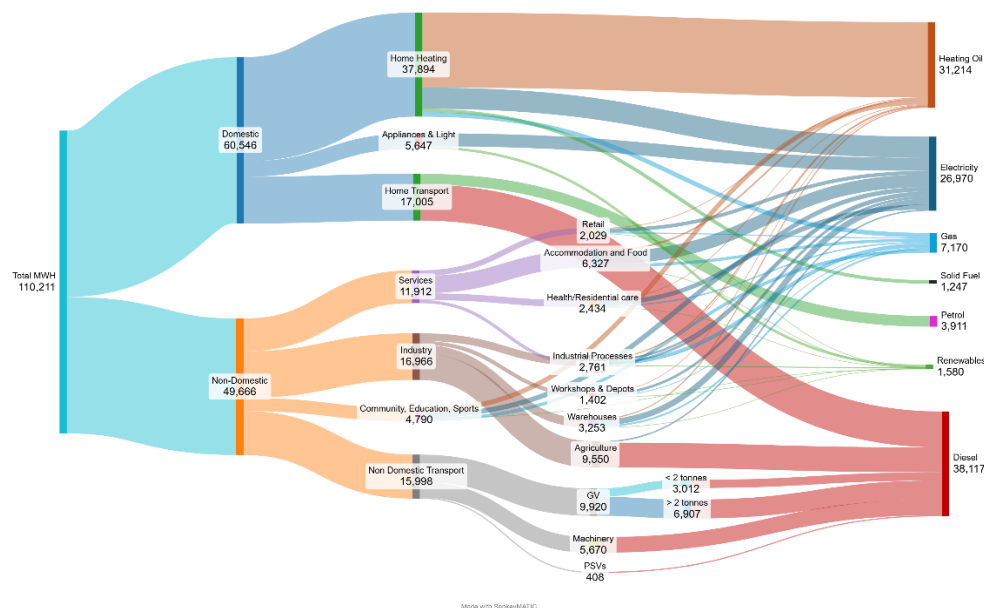


Figure 4: Breakdown of Fuels Across All Sectors in MWh per year

Homes in Joyce Country SEC: high energy demand and significant retrofit potential

The residential sector is central to the Joyce Country energy transition. The report identifies 1,120 occupied homes, of which approximately 96.5% are houses or bungalows. The housing stock is predominantly rural and detached, and a greater proportion of homes were built before 1945 than across Ireland as a whole.

Estimated annual household energy consumption is 43,541 MWh, averaging approximately 38,875 kWh per home. The report compares this with a national average of 20,424 kWh per home, although differences in dwelling size and rural characteristics help explain the gap.

Of the 363 homes with a recorded Building Energy Rating (BER), 72% are rated C1 or lower, while 16.5% are rated E1 or lower. The report also estimates that 62% of homes fall within C2 or below and that approximately 80.7% rely on fossil-fuel heating systems. Only around 7% of homes have some form of renewable energy installed.

The findings suggest that improving the housing stock requires more than targeting the least efficient homes. Upgrades to C-rated homes could also deliver meaningful energy savings, while better insulation, improved building fabric and more efficient heating systems can reduce both fuel costs and emissions.

The report highlights the social consequences of poor energy performance. Its estimated household energy costs indicate that some residents may struggle to heat their homes adequately. Energy improvements should therefore be considered not just a climate measure but also a means of improving comfort, affordability and health.

The geographical distribution of poorly rated homes provides a starting point for prioritising retrofit support, particularly in the south and west of the study area.

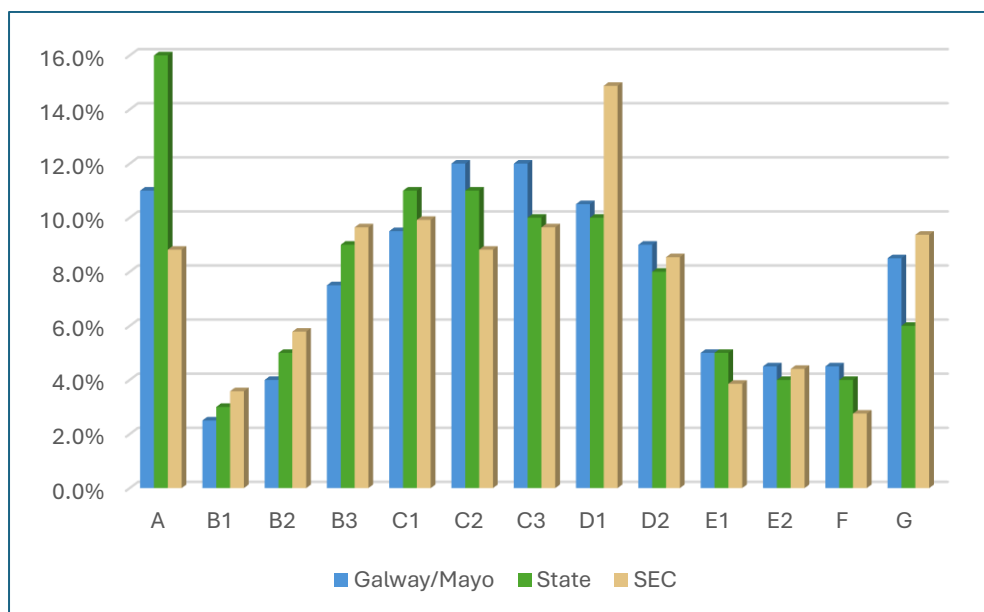


Figure 5: Comparing BER levels: Counties Galway/Mayo, the State, and Joyce Country SEC

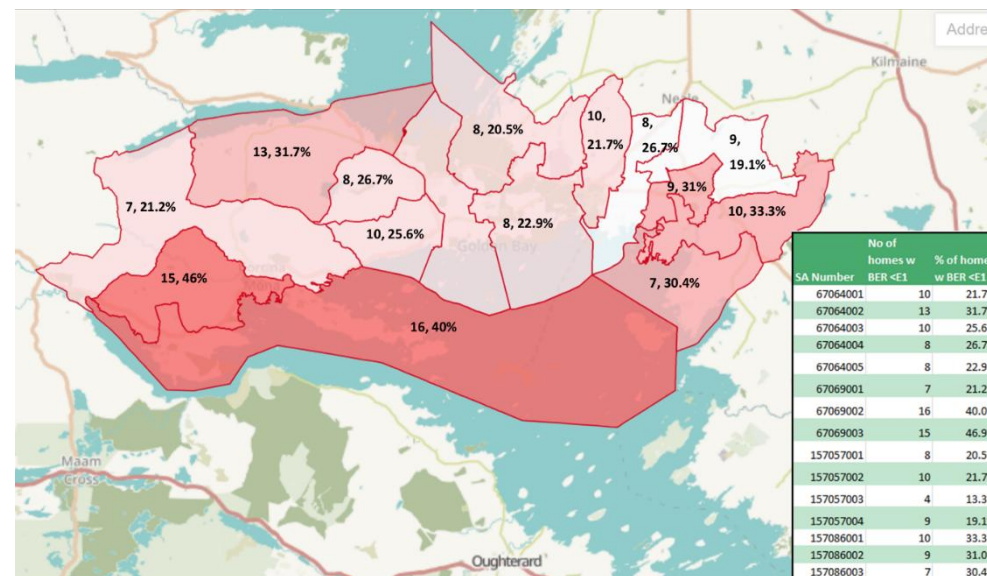


Figure 6: SEC Small Areas by % homes with BER of E1 or less

Transport: rural dependence on fossil fuels

Transport is another major contributor to the community's energy use. The report estimated annual transport energy demand at 42,028 MWh in its aggregated baseline.

The area has approximately 1,763 cars across 1,120 households, equivalent to 1.6 cars per household. County-level vehicle data are used to estimate the local fuel mix, with diesel accounting for the largest share. We estimate that private car use alone generates



approximately 4,427 tonnes of CO₂ annually and costs nearly €3 million in fuel.

Rural settlement patterns, longer journeys and limited public transport options make reducing car dependence more difficult than in urban areas. However, the report notes that 36.7% of commutes take less than 15 minutes, suggesting that some journeys may be suitable for walking, cycling, shared transport or other alternatives where local conditions allow.

Electric vehicles offer an opportunity to reduce transport energy consumption and running costs. The report compares the energy requirements and costs of electric and conventional cars, providing a basis for further assessment in the Register of Opportunities.

Figure 7 Shows how the SEC's geography affects the reliance on the domestic car for transport to work and school. This can be made more sustainable in an efficient and cost-effective manner.

Businesses and community buildings⁸

The non-domestic sector includes shops, hotels, restaurants, farms, schools, community centres, healthcare facilities, warehouses and industrial premises. The report combines a survey of local buildings with estimates of energy consumption based on building types and floor areas.

We estimated non-domestic energy expenditure at approximately €8.17 million annually and reports associated emissions of 12,208 tonnes of CO₂ for the sector as defined in its summary. Businesses and community facilities therefore represent an important part of the local energy transition.

The RoO will demonstrate the sustainability benefits of building efficiency, heating-system improvements, renewable electricity, transport-fuel reduction and opportunities for collaboration between local organisations.

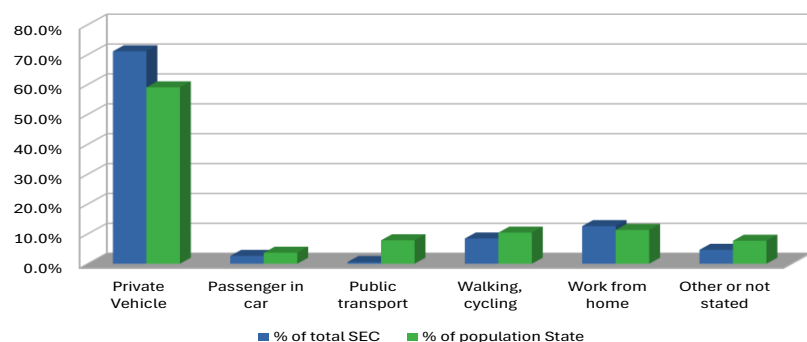


Figure 7: Means of transport to work, school or childcare: SEC and the State

⁸ Two large energy users are excluded from the aggregated baseline as commercial confidentiality prevented issues disclosure in this document.

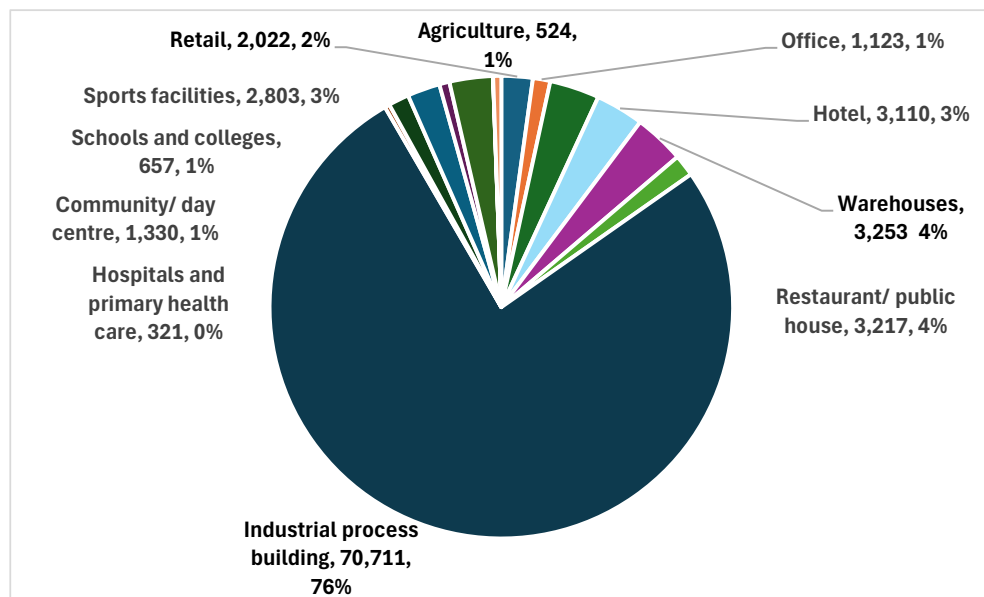


Figure 8: SEC energy use in MWh by Business type

Figure 8 includes the energy use of Earraí Coillte Chonnacht Teoranta (ECC). It should be noted that ECC predominantly uses renewable heat in its operations.

Energy costs, carbon emissions and renewable energy

The financial implications of energy consumption are substantial. The report estimates annual domestic expenditure on home energy and personal transport at more than €12.6 million. It places the combined

energy-related emissions of the domestic and non-domestic sectors at approximately 26,977 tonnes of CO₂ per year.

These figures show that reducing energy demand could bring economic benefits alongside environmental improvements. Insulation and heating upgrades, more efficient equipment, reduced fuel consumption and appropriately sized renewable energy installations could help households and businesses reduce their exposure to fossil-fuel prices.

There is a significant opportunity to expand local renewable generation. However, Joyce Country's sensitive landscapes and internationally important natural areas constrain the locations and types of infrastructure that may be appropriate. Localised generation, including solar photovoltaic systems will provide sustainability opportunities that are compatible with the need to protect the SEC's biodiversity and landscape character.



From baseline to action

This study is intended to be the foundation for the SEC's Register of Opportunities, which will identify and assess practical projects for the community.

Our findings point towards several priorities:

- Improving energy efficiency across existing homes and non-domestic buildings.
- Targeting retrofit support according to building performance, need and affordability.
- Reducing dependence on heating oil, diesel and other fossil fuels.
- Assessing opportunities for solar PV, micro-hydro and other locally appropriate renewable technologies.
- Exploring more sustainable transport options suited to rural circumstances.
- Ensuring that the benefits of energy improvements are distributed fairly across the community.