TRIM ENERGY MASTER PLAN

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Trim profile

Located along the banks of the River Boyne in County Meath, Trim is a vibrant and flourishing market town and is the administrative centre for southwest Meath. Trim is specifically situated on the R154, which connects with the M3. meaning Dublin is less than an hour's drive away from the town.

Trim has enjoyed steady growth in its population, with the 2016 census results revealing that just under 9,000 people lived in the town, with 37,000 people living within a 15-minute radius thanks to its close proximity to Dublin. This has meant that behind Navan, it is one of the largest towns in County Meath.

Trim has the unique status as being classified as one of Ireland's heritage towns. This is due to its strong historical past, as Trim once had the oldest and largest religious settlements in the country and still has more medieval buildings than any other town in Ireland. The town is dominated by the medieval Trim Castle, which was built by Hugh de Lacy in 1173. The largest Norman castle in Europe, it is now restored, and visitors can access the grounds by guided tour.

Nowadays, Trim is more known for being a picturesque town, with its streets lined with cafés, eateries, and small boutiques. The quality and abundance of natural heritage provided by the Trim's location along the River Boyne is an extremely valuable asset for the town making it an ideal setting for walkers, in particular for those interested in learning more about the town on the Trim Historic Trail.

There is a strong sense of community spirit evident in Trim. Trim is a town that cares about the quality of its streetscapes. It has enjoyed success in the Tidy Towns competition, being overall winner on 3 occasions. While in 2012, Trim was recognised as the top litter free town in the county by the Irish Business against Litter Organisation.

Recently this civic pride has been reflected by the creation of the Trim SEC, which is a volunteer group dedicated to increasing quality of life for the people of Trim through energy efficiency projects, improving public transport and reducing the towns reliance on fossil fuels.

Glossary of Terms

Although all efforts have been made to keep the language in this report non-technical, through the use of infographics and normal language it is not always possible. To mitigate against this, we have provided a glossary of key terms used through-out this report and an explanation of their meaning. An additional excellent resource for understanding all terminology around energy and environment is https://climatejargonbuster.ie/wp-content/uploads/2021/02/ClimateJargonBuster_A-Z_a.pdf

Building Energy Rating (BER) - BER stands for Building Energy Rating. A BER certificate shows you the energy performance of your home. It is a good indicator of how much you will spend on energy (like heat and light) and how much CO_2 you will release to heat your home to a comfortable level.

The BER rating goes from A to G. A-rated homes are the most energy efficient, comfortable and typically have the lowest energy bills. G-rated homes are the least energy efficient and require a lot of energy to heat the home.

Carbon Dioxide/ CO_2 - Carbon dioxide is a powerful greenhouse gas. It is naturally part of the air we breathe. However, human activities like burning of fossil fuels and deforestation have led to an increase in CO_2 in the air that contributes to climate change.

Carbon Footprint - Carbon footprint measures the carbon emissions linked to a particular activity or product. It includes emissions involved in all stages of making and using a product or carrying out an activity. The lower the carbon footprint the less that a product or activity contributes to climate change.

Energy Efficiency - It is energy efficient when we use less energy to achieve the same result.

Energy Savings - Energy in whatever format it is being consumed usually costs money (€). By reducing the amount of energy consumed you are also reducing the cost associated with providing that energy.

Greenhouse Gas Emissions (GHGs) - Gases that trap heat from the Earth's surface causing warming in the lower atmosphere and slowing down loss of energy from Earth. The major greenhouse gases that cause climate change are carbon dioxide, methane and nitrous oxide.

Kilowatt hours (kWh) - One kilowatt-hour is equivalent to 1000 watts of energy used for 1 hour. For example, a 100-watt lightbulb switched on for 10 hours uses one kWh of electricity.

Megawatt hours (MWh) - A megawatt hour is equivalent to 1 million watts of electricity being used for an hour. 1 MWh is equivalent to 1,000 kWhs. For example, a megawatt hour could be 2 million watts (2 megawatts) of power being used for half an hour

Net zero emissions - This refers to achieving an overall balance between greenhouse gas emissions produced by human activity and greenhouse gas emissions taken out of the atmosphere

Renewable Energy - Renewable energy comes from renewable resources like wind energy, solar energy, or biomass. These resources can regenerate naturally, and we can use them repeatedly without reducing their supply.

Renewable Electricity Support Scheme (RESS) - This Government scheme provides financial support to renewable electricity projects in Ireland to help us achieve our renewable electricity goals. It also aims to increase community participation in, and ownership of, renewable electricity projects. It aims to make sure electricity consumers get value for money and to improve security of our electricity supply.

Register of Opportunities (RoO) - The Register of Opportunities is a list of projects or opportunities within your community which if executed will result in energy efficiency and a reduction in energy use and the associated CO_2 output.

Thermal Energy - Defined as energy used to generate heat. This commonly refers to the energy used to heat homes by burning oil, timber peat or using electricity in heat pumps.

Sustainable Energy Community (SEC) - An SEC is a community in which everyone works together to develop a sustainable energy system. To do so, they aim as far as possible to be energy efficient, to use renewable energy where feasible and to develop decentralized energy supplies.

Units

Throughout this report we present energy use and energy production, in kilowatt or megawatt hours per annum (KWh/yr) and (MWh/yr). These units of measurement are used regardless of the fuel used. As a reference point, a typical house consumes approximately 22MWh per annum. We also present carbon emissions in tonnes or kg of CO_2/annum. Energy costs are presented in euro spent on energy per annum.

Ireland's Climate Action Plan 2021

- The Climate Action Plan (CAP) is a roadmap developed by the Irish government for taking decisive action to reduce Ireland's emissions by 51% of the 2018 levels by 2030, and net zero by 2050. This roadmap sets out targets for achieving these goals and means to go about it. This is done sector by sector with a clear goal set out for each sector. Table 1 shows the proposed emissions reductions by sector to achieve the targets set out in this plan

- The statutory national climate objective and 2030 targets are aligned with Ireland's obligations under the Paris Agreement and with the European Union's objective to reduce GHG emissions by at least 55% by 2030, compared to 1990 levels and to achieve climate neutrality in the European Union by 2050

- Targets for each sector of the economy will be updated annually, including in 2022, to ensure alignment with the governments' legally binding economy-wide carbon budgets and sectoral ceilings

- Whilst all the sectors referenced in Table 1 are relevant in some form or another to this EMP, of particular importance are the Electricity, Transport and the Built environment sectors, which feature prominently in the report

Table 1 – Summary of the sectoral targets within the Climate Action Plan

Sector	2018 Emissions (Megatonnes of CO2 equivalent)	2030 target Emissions (Megatonnes of CO2 equivalent)	% Reduction relative to 2018
Electricity	10.5	2 - 4	62-81%
Transport	12.0	6 - 7	42-50%
Built environment	9.0	4 -5	44-56%
Industry	8.5	5 -6	29-41%
Agriculture	23.0	16 - 18	22-30%
Land use, land use change, Forestry & Marine	4.8	2 - 3	37-58%
Unallocated Savings	N/A	4	N/A

- One of the standout targets for the Electricity sector which is particularly relevant for the SEC is the target increasing the amount of electricity generated by renewable sources up to 80%. SEC's can play their part through small-scale renewable energy generation in the community as will be discussed later in the report

- Regarding transport, the expectation is that Electric Vehicles will cover 40% of car journeys by 2030. Conversely, public and active transport services will receive heavy investment, enabling an additional 500,000 daily journeys

- Perhaps the sector of most importance to the SEC is the Built Environment. In the residential sector some of the most ambitious targets include:
  - Retrofitting 500,000 homes to a B2 equivalent BER standard
  - Installing 600,000 heat pumps in residential buildings

Energy Master Plan Summary

To assist in achieving the Trim Sustainable Energy Community's goals, an Energy Master Plan study has been conducted. This Energy Master Plan (EMP) has been funded by SEAI to assist in developing and refining short, medium and long-term plans for the Trim Sustainable Energy Community.

The Master Plan aims to help communities understand their current energy usage and carbon footprint so that they can understand where they currently are, thereby allowing them to set reduction targets for the future.

The information gathered and tools developed to review projects will help the SEC strive toward being an exemplar model in the transition to a low carbon community.

The Energy Master Plan is based on a mixture of desktop research utilizing publicly available information sets from a range of sources CSO, SEAI, POWSCAR, CIBSE, Pobal, County Council, etc.

Using modelling tools and methodologies developed inhouse by Plan Energy Consulting, the Energy Master Plan will also capture the energy consumption, emissions and spend within the community.

The EMP report begins with a sectoral energy breakdown that will give a broad overview of each sector's (Residential, Commercial, Transport) energy consumption, energy cost and contribution to CO_2 emissions in the Trim SEC, followed by a brief discussion on how the SEC compares to national averages.

These sections form the basis of the recommendations and options supplied for a transition to renewable energy sources in each of the sectors as well as opportunities for energy reduction and increased efficiency within the Register of Opportunities document.

The EMP will identify the potential for the implementation of sustainable transport models such as electric vehicle (EV) charging infrastructure, alongside renewable energy generation possibilities from varying sources such as wind, solar etc.

Reviewing the natural resources available to the community, high level analysis is provided on various renewable energy technologies that the community could further pursue. A wide range of natural resources are often within a community's grasp, however the understanding of how to progress from a concept through to reality can be an enormous barrier.

This EMP outlines the processes required by the SEC to quantify what these resources can offer, alongside how renewable projects can transition from an idea to a system that is owned by the community, contributing to the sustainable, decarbonisation of the area.

Finally, the EMP will conclude with an Action Plan and Register of Opportunities section, which the community can use as a benchmarking tool, as they seek to become more energy efficient and reduce their carbon footprint over the next decade.

Perhaps the primary benefit of the EMP is that it can be used as a roadmap for the SEC's progression towards sustainable energy and can be used to support applications for capital grants to upgrade existing housing and commercial building stock.

Additionally, the EMP can also be used as a mechanism to increase awareness in energy efficiency. This process begins through the interactive community survey issued, meetings with the SEC committee, energy audits on buildings within the community and the launch of the report at its conclusion.

This report includes recommendations, demonstrating examples of what the community can do to change behaviour and increase the understanding of climate action and how those involved can contribute toward this shared objective of reducing their impact on the environment.

The EMP covers 31 Small Area Plans [1] which are defined by the Central Statistics Office (CSO) and are shown below in Figure 1.

Figure 1 - The image depicts the area covered by Trim SEC. This was generated using the Small Areas as defined by the Central Statistics Office (CSO SAPMAP 2016).

[1] *Small Areas are areas of population generally comprising between 80 and 120 dwellings created by The National Institute of Regional and Spatial Analysis (NIRSA) on behalf of the Ordnance Survey Ireland (OSi) in consultation with CSO. Small Areas were designed as the lowest level of geography for the compilation of statistics in line with data protection and generally comprise either complete or part of townlands or neighborhoods. There is a constraint on Small Areas that they must nest within Electoral Division boundaries.*

Executive Summary

The table below provides a holistic overview of the energy consumption, emissions and cost associated with Trim SEC.

Table 2 – SEC Total Energy, CO_2 and Cost Analysis

	ELECTRICITY	**FOSSIL FUELS**	**TRANSPORT**	**TOTAL**
ENERGY MWh	42,581	60,625	37,862	141,068
CO2 EMISSIONS tCO2	21,362	13,866	8,934	44,162
TOTAL ENERGY COST	€4,826,869	€14,178,507	€4,578,611	€23,583,986

As already mentioned, the EMP breaks down the energy consumption and fuel mix within the community's catchment area into 3 key sectors consisting of:

1) Residential
2) Non-Residential
3) Transport

The sectoral baseline energy usage analysis, which will be discussed in more detail in later sections, is summarized in Table 3 in the form of an energy balance for the whole catchment area. This provides a full picture of how much energy is used in each sector, which helps identify and prioritize areas for action by the Trim SEC.

Table 3 – Sectoral percentage energy consumption

Trim SEC Primary Energy Baseline (kWh)				
Sector	**Electricity**	**Fossil Fuel**	**Renewable**	**Total** (MW)
Residential	30,667,806	45,560,851	320,743	76,549
Non-residential	11,913,373	15,064,247		26,978
Transport	54,184	37,807,611		37,862
Total Energy	42,635,363	98,432,709	320,743	141,389

Our analysis of the energy consumption within the catchment area has identified that 54% of the energy demand relates to the residential sector, 19% for the commercial sector and approximately 27% relates to the Transport sector.

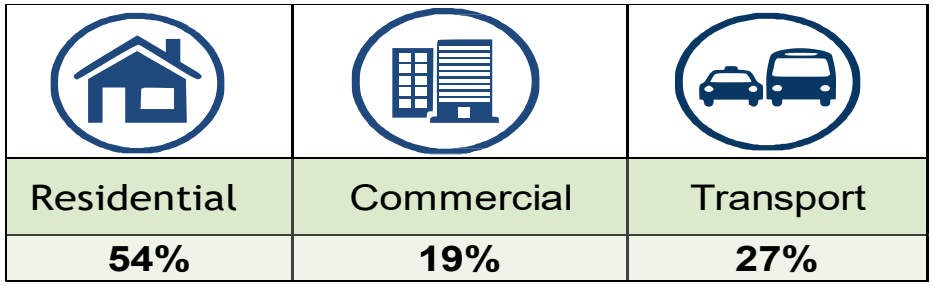


Figure 2 – Sectoral percentage energy consumption

Residential sector

Background

The Residential sector is one of the largest emitting sectors in Ireland, accounting for 29% of CO_2 emissions and roughly a quarter of the energy used in Ireland as per 2020 estimates from SEAI. Therefore, if communities want to make progress towards individual targets, as well as contributing to the national target of reducing all CO_2 emissions 51% by 2030, it is vital this sector is given particularly close focus.

Whilst energy usage from the residential sector has increased by almost 19% from 2014 to 2020, emissions only subsequently increased by 1%. This can be explained by higher household incomes and expenditure, which led to higher energy usage but have been balanced out by improvements in energy efficiency as a result of updated building regulations and homeowners increasingly more willing to invest in fabric upgrades within their homes.

The momentum within the country has been to ensure that as many homes as possible are upgrade their homes insulation ahead of 2030, with the Irish Government setting the ambitious target of 'retrofitting' [2] 500,000 homes to a B2 Building Energy Rating (BER) by 2030. By retrofitting homes in a manner that focuses on enhancing their insulation, homeowners don't have to use as much energy on space heating within their home, which will naturally lead to emission reductions within the residential sector.

[2] A process where you look at the house's overall energy efficiency and use a combination of measures to improve it.

The residential section of this report will seek to analyse what retrofit measures may be suitable for properties in the Trim SEC based upon Housing age, occupancy, ownership and type.

Furthermore, the fuels used to heat homes within the Trim SEC are analysed for their Emissions in tonnes of CO_2 equivalent. The fuel mix can have a significant impact on the carbon footprint of a community as each fuel type has its own associated CO_2 output. For example, coal produces approximately 0.4kg and 0.3kg of CO_2 for every kilowatt hour of energy delivered, compared to just over 0.2kg for natural gas.

The BER is based upon the provision of space heating, water heating for domestic purposes, ventilation, and lighting. The BER does not include what are called point load consumption such as plugged-in electrical appliances. An excellent reference which provides a breakdown of all energy used in the home is the "SEAI Energy in the Residential Sector 2018 Report.

A breakdown of the communities BER ratings per Small Area Plan is provided, which helps identify those sectors of the community which require most investment in terms of improving their BER. Given that a BER is a reflection of a home's energy efficiency, a lower BER (e.g. G) will imply that homeowners are using more fuel to heat their homes, which is in direct contradiction with the 2030 target's set by the Government. A communities' BER is also closely linked to social deprivation and fuel poverty.

Given the continued rise in energy costs, a strong BER can alleviate homeowners from fuel poverty and prevent others from going into it.

Method

An analysis of the residential housing stock in the catchment area of Trim SEC has been carried out based on Central Statistics Office (CSO) data and the Eircode data provided by ESRI.

The residential housing stock is based on a baseline year of 2016 and a breakdown of the number of residential units which are vacant or classified as holiday homes is derived from the Eircode Database which is based on a baseline year of 2021. Statistics for residential heating are based on national averages against primary heating type. This allows for future analysis against future census data.

The SEAI Building Energy Rating (BER) Map shown in Figure 9 displays colour coded 'Small Areas' of the Trim SEC. The colour of a given small area represents the BER of the median geo-located dwelling in that small area. The map only contains BER Information at the Small Area level for dwellings that have had a BER completed.

The medians were derived from all geo-located dwellings with a BER in that particular Small Area. SEAI's corresponding prices and emission factors as of 2020 were applied to calculate the total spend and CO_2 emissions for various sources of energy and heating.

Results and Analysis

Housing Ownership

Within the catchment area approximately 73.7% of the housing is owner occupied. With a 30.7% outright ownership, this can imply a greater appetite to engage in home retrofits as the occupiers are the decision makers in relation to energy upgrades and have a clear incentive to upgrade.

Equally, for rental properties, it is in landowners' best interests to upgrade the homes they own with retrofit measures in line with the projected minimum BER increases for rental properties that the Government are implementing from 2025.

However, given that landlords themselves will not reap the benefits of a warmer home and cheaper energy bills, a strong strategy of engagement and encouragement will be required for landlords until obligatory measures come into effect.

Table 4 – Percentage of homes owned outright by owner

Occupancy type	No. of homes	% of homes
Owned with mortgage or loan	1316	43.0%
Owned outright	939	30.7%
Rented from private landlord	464	15.2%
Rented from Local Authority	246	8.0%
Rented from voluntary/co-operative housing body	16	0.5%
Occupied free of rent	24	0.8%
Not stated	52	1.7%
Total	**3057**	**100%**

Housing Type

A very significant percentage of the housing stock in the catchment is classified as detached, semi-detached or terraced housing with a small percentage classified as flats or apartments. Flats and apartments mainly consist of smaller developments or over the shop dwellings. This again is a positive sign for Trim SEC, as the options for retrofitting a home increase with detached, semi-detached and terraced housing as there is less chance of interfering with other properties.

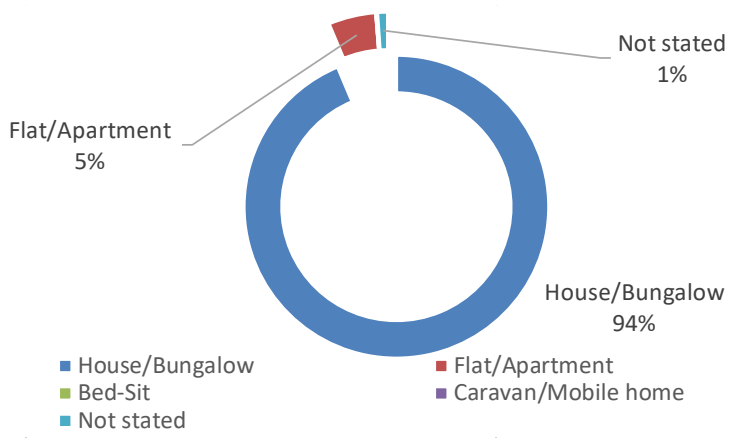


Figure 3 - Housing Stock percentage type

Housing Age

Figure 4 illustrates the age spread of the residential housing stock in the catchment area. The age of the properties is displayed alongside a breakdown of the introduction of the buildings regulations which have had an incremental impact on the construction methodologies used. This information can be quite informative as it illustrates the type of interventions which may be suitable for the housing stock.

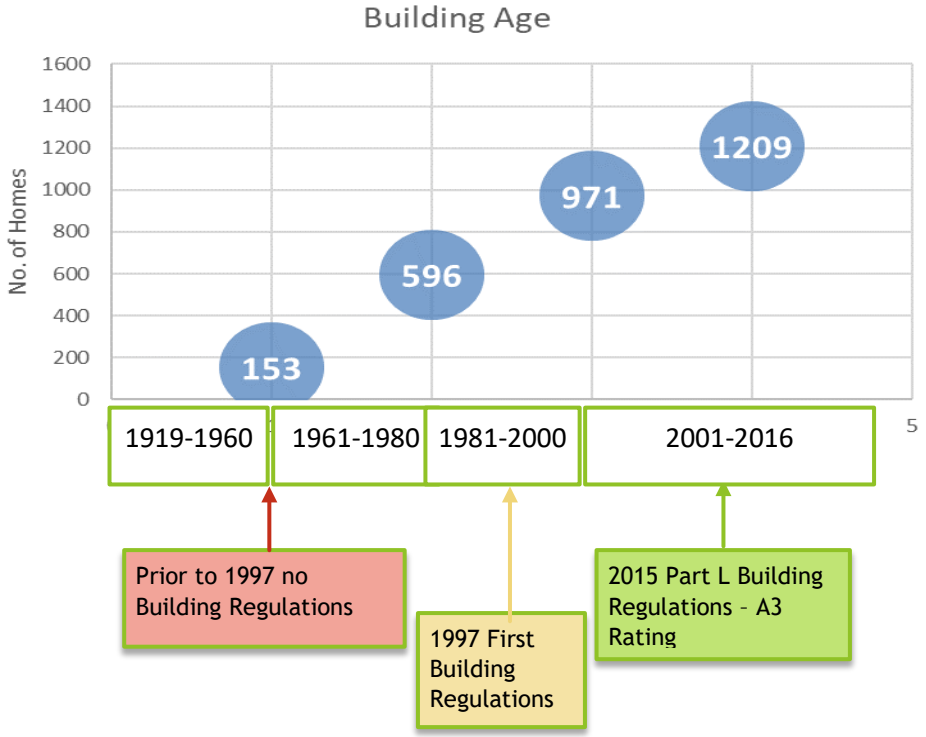


Figure 4 - Relationship between Dwelling Age and Irish Building Regulations

Within the catchment area there is a good mix of housing age types which will each require different energy efficiency measures to achieve the overall goal of a more energy efficient housing stock. 39.5% of Trim's housing stock would be considered modern having been constructed after the year 2000, which indicates that measures such as cavity insulation improvements and attic insulation can be promoted.

Housing which was constructed prior to the introduction of the building regulations tended to be solid wall or hollow block construction which is unsuitable for cavity insulation due to the lack of a suitable cavity. These buildings tend to be more suited to internal or external insulation measures[3].

With 35.1% of dwellings having been constructed from pre 1919 – 1990, this strongly indicates that a very large number of homes will present opportunities to improve energy efficiency and reduce their energy requirements. However, the types of buildings within lower age bands present many challenges due to the historic construction methods applied from their era and the materials used, alongside the important significance associated with preserving the heritage of these homes.

Table 5 – Age profile of the Trim SEC housing stock

Period	No. of homes	% of homes
Pre 1919	56	1.8%
1919 - 1945	51	1.7%
1946 - 1960	46	1.5%
1961 - 1970	140	4.6%
1971 - 1980	456	14.9%
1981 - 1990	324	10.6%
1991 - 2000	647	21.2%
2001 - 2010	1111	36.3%
2011 or later	98	3.2%
Not stated	128	4.2%

[3] External Wall insulation involves fixing insulation materials such as mineral wool or expanded polystyrene slabs to the outer surface of the wall. The insulation is then covered with a special render to provide weather resistance. A steel or fiber-glass mesh is embedded in this render to provide strength and impact resistance.

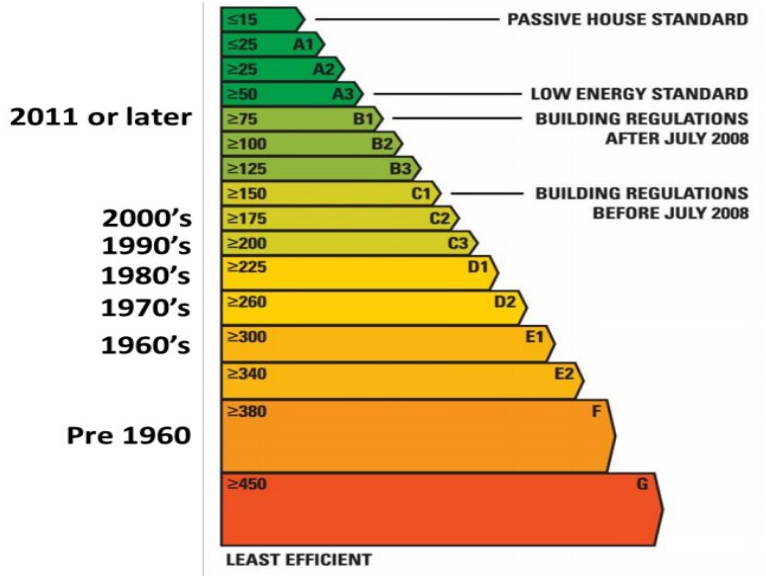


Figure 5 - Typical BER for house age type before upgrade works

Housing Fuel Mix

The residential fuel mix as illustrated in Figure 6 provides a breakdown of the different types of fuel sources used in the community. By using less carbon intensive fuels, a community can significantly reduce the CO_2 footprint from the energy it consumes to heat its homes. The ideal situation for any community is to reduce the level of energy required to heat their homes through energy efficiency measures and to provide the remaining heat requirements from low or natural CO_2 producing fuel sources.

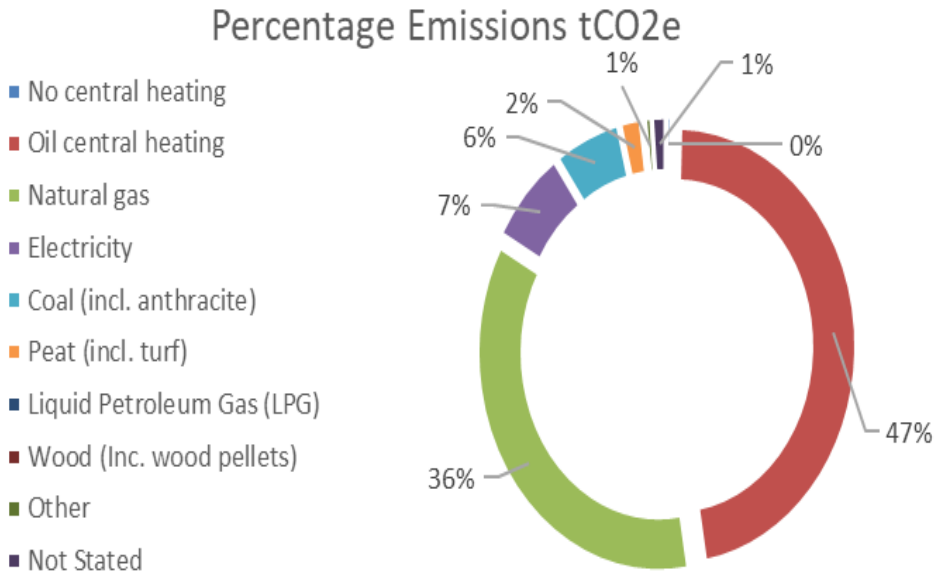


Figure 6 - Percentage emissions in tCO_2e

Within Trim SEC, the main fuel type is currently natural gas and oil which make up 89% of the total thermal energy consumed. Combined, these two fuel types make up 83% of the CO_2 emissions from the residential sector. Oil is the primary source at 47% which is typical for the large proportion of houses built pre-2011. Whilst this finding does raise cause for concern, it also demonstrates the huge level of potential for the community to significantly reduce its carbon footprint.

Table 6 - Residential Fuel Mix

Heating Type	NO. OF UNITS	Fuel	% of Total Thermal Energy	Thermal TFC (kWh)	Emissions tCO_2e
No central heating	13	Oil	0%	180,505	47.6
Oil central heating	1379	Oil	45%	19,147,415	5053.0
Natural gas	1352	Natural Gas	44%	18,772,520	3842.7
Electricity	53	Electricity	2%	1,591,763	768.5
Coal (incl. anthracite)	134	Coal	4%	1,860,590	633.7
Peat (incl. turf)	40	Peat	1%	555,400	197.7
Liquid Petroleum Gas (LPG)	11	LPG	0%	152,735	35.0
Wood (Inc. wood pellets)	21	Wood Pellets	1%	291,585	0.0
Other	17	Other	1%	236,045	60.7
Not Stated	37	Other	1%	513,745	132.0
Totals	**3057**			**41,710,540**	**10,002**

Housing BER Coverage

An analysis of the Building Energy Rating (BER) of the current residential housing stock within the catchment area was carried out. The average BER rating has been determined, however this figure is based upon a limited number of buildings which have had BER's carried out on them and should be reviewed in that context.

By analysing the BER data files for all the small areas in the Trim SEC region, the following information was observed:

Of the 3,057 homes registered within the heatmap catchment of the Trim SEC region, 47% of these homes have BER certificates. Whilst the number of dwellings in Trim with a BER of B or greater is higher than the national average (22.7% vs 11%), it lies below the national average for its overall BER.

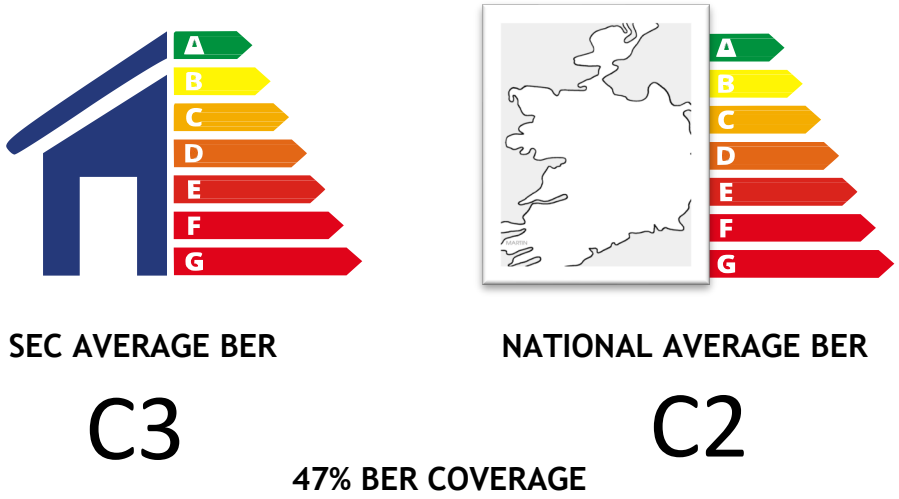


Figure 7 - Building Energy Rating information on catchment

The data in Figure 8 indicates that Building Energy Ratings for a large volume of Trim SEC's residential building stock ranges from a C1 to an D2, 65.7% collectively, with such dwellings requiring between 150-300 kWh/m2/yr. of energy.

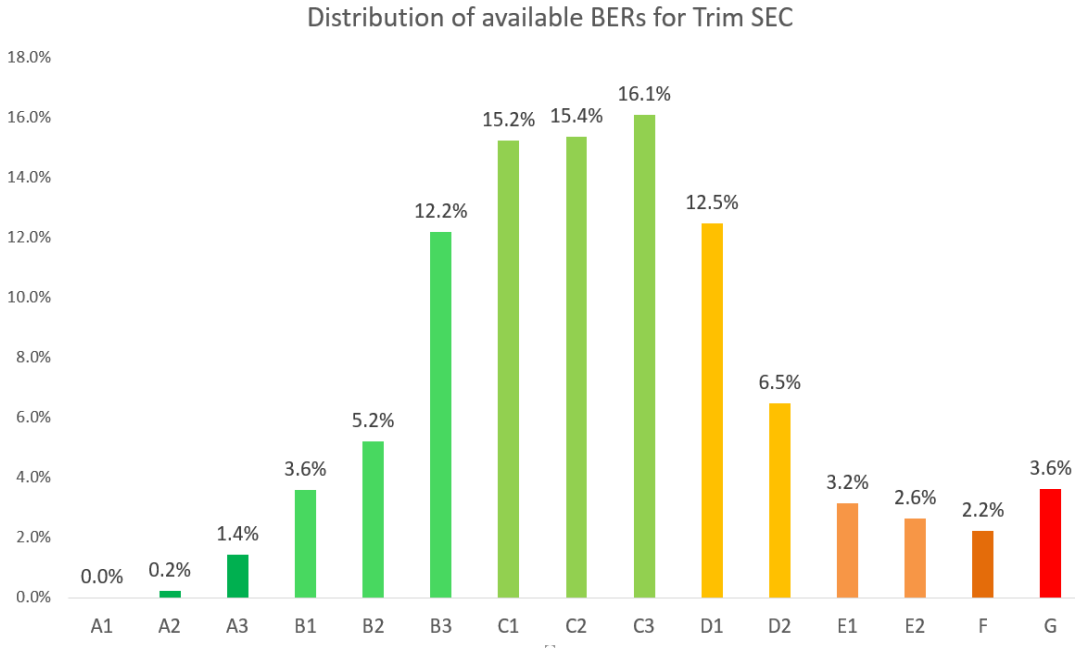


Figure 8 – Distribution of available BERs for Trim SEC

The chart above indicates that 89.5% of the housing stock in the Trim SEC are below the Irish Government's target BER B2. However, of that 89.5%, approximately 59% lies within a boundary of B3 – C3 which shows that a majority of the housing stock can be brought up to this rating without deeply extensive retrofitting measures.

It's interesting for SECs to see how each subsection of their community fares in terms of BERs. This can reveal insights into fuel poverty and nudges decision makers towards those areas in need of most investment. The map below of the Trim SEC illustrates the median BER's which have been recorded in each Small Area Plan.

It should be noted that this information is based on a limited amount of BER data and presented in an illustrated format to allow for comparison in future reports.

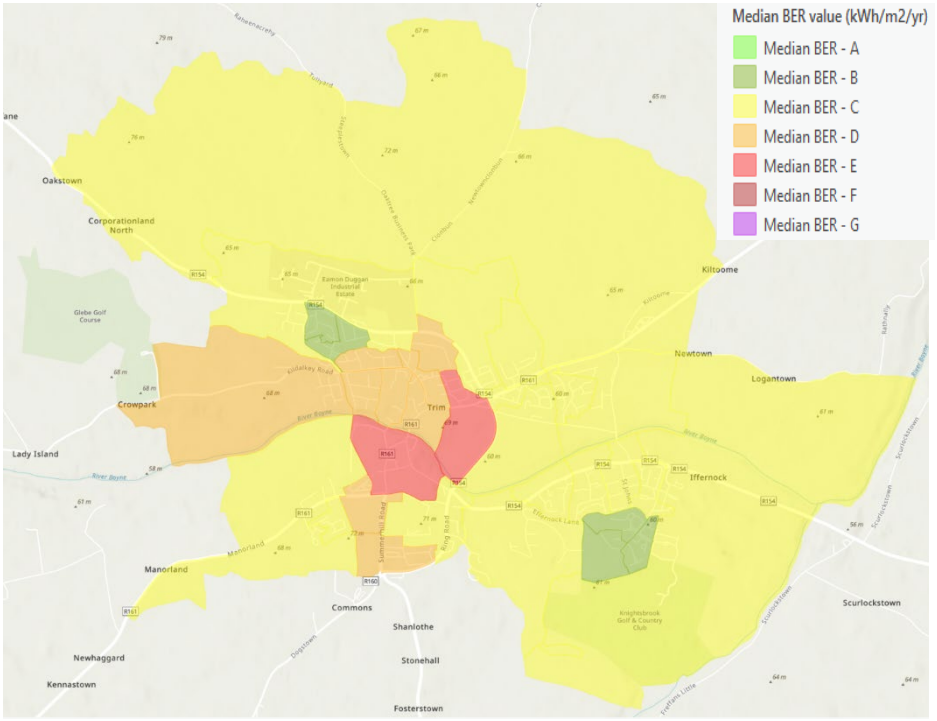


Figure 9 - Map of Median BER in SEC Catchment Area.

When we compare those Small Area Plans with a poor BER rating in the image above, to those which score poorly on the Pobal deprivation index (Figure 10), we can see there is a correlation between the two. This sort of data provides local decision makers and the Trim SEC with the appropriate knowledge about their area, so that they can prioritise which areas should receive investment for home energy upgrades.

These two images make clear that it is the Trim Urban Area, specifically those areas close and adjacent to the town centre which are in most need of investment in terms of upgrading the energy efficiency of homes.

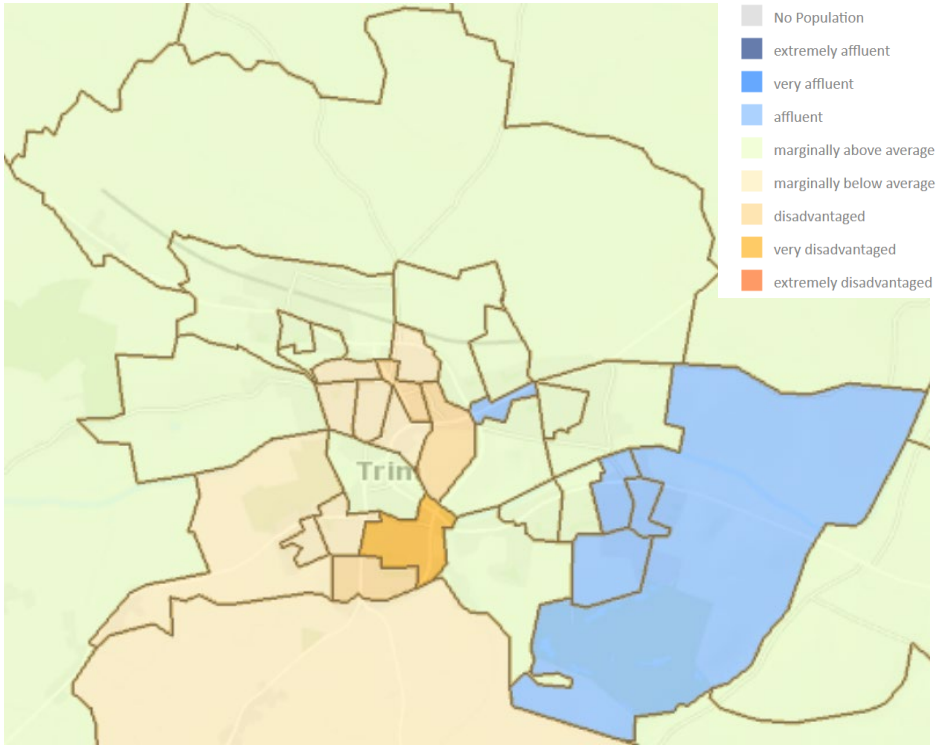


Figure 10 – Trutze Haase Pobal HP Deprivation index for the Trim SEC catchment area

Residential Energy Baseline

To calculate the residential sector's energy baseline, national residential data was obtained from the Central Statistics Office (CSO) Small Area Population Statistics (SAPS), which lists the housing stock present in the area by house type and year of construction.

Table 7 - Residential Energy, CO_2 and Spend

	Electricity	Fossil Fuel	Renewable	Total
Total Primary Energy (kWh)	30,667,806	45,560,851	320,744	76,549,400
Total CO_2 (tonnes)	14,806	11,003	0	25,809
Total Spend (€)	€2,778,960	€1,976,467	€22,044	€4,777,470

For homeowners who wish to upgrade their BER's, The Sustainable Energy Authority of Ireland (SEAI) provides financial incentives to homeowners in the form of grants and supports, details of which can be found in the Appendices. It's important that homeowners are supported throughout the application process, so that they are investing in measures that are appropriate for their home.

Whilst the costs of many of the retrofit measures associated with improving a home's energy efficiency may appear prohibitive on the surface for both lower income groups and landlords alike, SEAI's new 'National Retrofitting Scheme' has meant home upgrades are more achievable for homeowners than ever before.

For example, homeowners can now avail of grants equivalent to 80% of the typical cost for attic and cavity wall insulation, with an upper limit of €2,500. These measures have been shown to improve energy efficiency significantly within typical Irish homes and should be an affordable measure for the majority of homeowners in Trim SEC.

Furthermore, the Warmer Homes Scheme offers free energy upgrades for eligible homeowners who are most at risk of energy poverty. A budget allocation of €109 million has been provided for this scheme this year. The scheme will target the least energy efficient properties, by prioritising homes that were built and occupied before 1993 and have a pre-works BER of E, F or G. Applications will also be accepted from qualifying homeowners who previously received supports under the scheme, but who could still benefit from even deeper measures.

Given that energy costs are expected to remain at the very least the same level in the coming years, if not increase further, it is vital that homeowners in lower income groups utilise these grant streams to protect themselves against falling into, or further into fuel poverty.

Please see the Appendix section for a Summary of these grants

Retrokit

Background

The momentum within the country has been to upgrade the fabric of buildings so that heat pumps can be utilised as the primary heating source. However, in order for heat pumps to be a viable option, buildings need to be insulated to a level where they have a Heat Loss indicator of 2.0 or less. SEAI define these dwellings as being 'heat pump ready' [4]. If properties are not insulated to an adequately high level, then this technology is not suitable as a primary heat source.

The government's climate action plan has set a Building Energy Rating (BER) of B2 as the target for the energy performance of retrofitted homes. This target is in line with current building regulations - 'Part L conservation of fuel and energy'[5], which specifies that buildings undergoing 'Major Renovations'[6] must achieve a BER B2 or 'Cost Optimal' level of energy performance.

In order to accurately identify the fabric upgrades that need to be carried out to upgrade Trim's residential housing stock to at least a BER rating of B2 (or better) and to achieve "heat pump readiness", a software package known as 'RetroKit' was employed.

Method

RetroKit is a decision-support tool developed by Retrokit Ltd. which compiles a wide range of data sources and applies clever analytics to establish the current energy performance of the housing stock in a community. It generates baseline data on energy performance of the housing stock in terms of energy use and expenditure, CO_2 emissions, BER rating and Heat Loss Indicator amongst many other variables.

RetroKit uses this data to develop and compare a range of retrofit scenarios:

1. Shallow Fabric,
2. Medium – (Oil Boiler),
3. Medium – (Heat pump),
4. Deep Retrofit (Heat Pump)

The software conducts a cost/benefit analysis of each scenario in order to identify the optimum retrofit package for the community's housing stock, e.g. a minimum B2 BER rating, decarbonizing the energy supply, eliminate fuel poverty, etc. It considers not only the technical factors, but also financial and environmental concerns.

[4] Heat Loss Indicator (HLI) value is the total heat loss per m2 of dwelling floor area. A minimum HLI of 2 Watts/Kelvin/m2 must be achieved to be suitable for a heat pump however in some cases, where upgrades may not be cost- optimal, a value of HLI up to 2.3 Watts/Kelvin/m2 can be accepted provided additional requirements are met

[5] https://assets.gov.ie/180475/e532a9c5-3ec6-4a4c-8309-02f8a653e2d8.pdf

[6] Major renovations refer to upgrades where more than 25% of the building envelope. Painting, re-plastering, rendering, re-slating, re-tiling, cavity wall insulation and insulation of ceiling are not considered major renovation works.

Once baseline analysis is completed, to determine the energy usage of Trim's housing stock, RetroKit runs a number of customised scenarios, based on the shallow, medium or deep fabric upgrade scenarios mentioned above, with associated upgrades to heating systems and renewable energy.

These scenarios are applied against the most common house types in the Trim community in order to exemplify what fabric upgrades would take place in each archetypal home through a home energy upgrade plan.

Whilst the use of standard assumptions (e.g. fixed heating schedules and hot water usage) and archetypes means that running costs and energy usage estimated by RetroKit will differ somewhat from actual data for specific dwellings, they provide a highly detailed representation of what the impact of a retrofit project would be for typical residencies in the Trim community.

These home energy upgrade plans will help homeowners in the Trim community understand how a house like theirs can be upgraded, the typical costs involved and include a breakdown of the revised BER rating, energy consumption, energy costs and payback period of the investment for the homeowner, along with many other variables for each scenario.

Measures are only applied by RetroKit where required and appropriate. This is done on a dwelling by dwelling basis. For example, for cavity wall insulation measures, RetroKit checks to see if the dwelling has a "cavity" wall and if the wall heat loss is high (and therefore worth insulating) before applying that measure.

Table 8 – Overview of each RetroKit Scenario

RetroKit Scenario	Non-exhaustive summary of works
Shallow Fabric	Basic measures such as better air tightness, cavity and loft insulation, cylinder insulation, LED lights and wood stove
Medium (boiler)	"Shallow fabric" plus External Wall Insulation, boiler, controls, new door, double glazing
Medium (Heat pump)	"Shallow fabric" plus External Wall Insulation, heat pump, controls, new door, double glazing
Deep (Heat Pump)	Medium (Heat Pump)" plus triple glazing, sloping ceiling internal insulation, demand control ventilation, Photovoltaic (PV) system

Results and Analysis

Heat Pump Readiness

RetroKit enables high level comparison of the four scenarios across a range of metrics that cover the entire Trim community, not just archetypal homes. This is the likelihood of dwellings in the scenario having a suitably low heat loss indicator (2.0 or less, or below 2.3 in certain cases) for a heat pump to perform effectively in the dwelling. A suitably low heat loss indicator is also needed if seeking grant funding for heat pumps. A dwelling should have additional fabric or airtightness measures applied if a heat pump is to be installed and if it isn't heat pump ready.

As per the graph below, 16% of residencies in the Trim SEC are Heat Pump ready, however this figure jumps to 46% under the 'Shallow fabric' scenario, meaning a significant proportion of homes in the community would only require a moderate amount of investment to be Heat Pump ready.

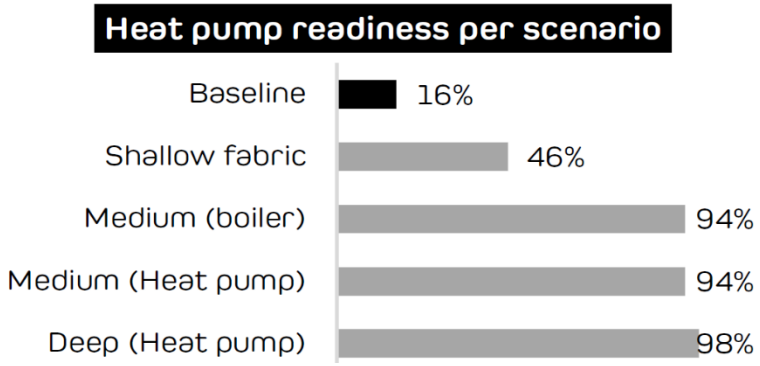


Figure 11 – Heat pump readiness under each RetroKit scenario for SEC

Reduction in Final Energy Use

Reduction in final energy use shows how far 'energy usage' is reduced compared to the baseline if the upgrades associated with each scenario were implemented into every home in the Trim SEC.

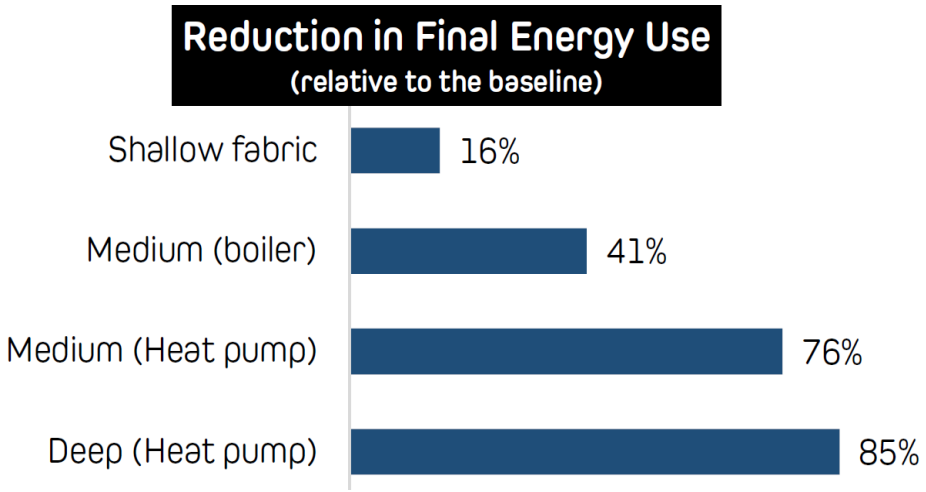


Figure 12 – Reduction in Final Energy Use compared to baseline data in the SEC

As can be seen from the graph above, significant reductions in energy use across the SEC can be achieved under the Medium (boiler) scenario, but particularly in the two Heat Pump scenarios. This is in alignment with the Irish Government's Climate Action Plan and the country's long-term goal of reaching net-zero emissions by 2050.

Total Annual Energy Savings

Naturally, reductions in energy usage will lead to a corresponding decrease in energy costs for the community. The total annual energy savings graph evidences the fuel cost savings per scenario, broken down by the age bands of dwellings in the SEC. As the below graph shows, the Trim SEC could save anywhere between €0.7 million - €2.7 million annually depending on which of the fabric upgrade scenarios were adopted by the community.

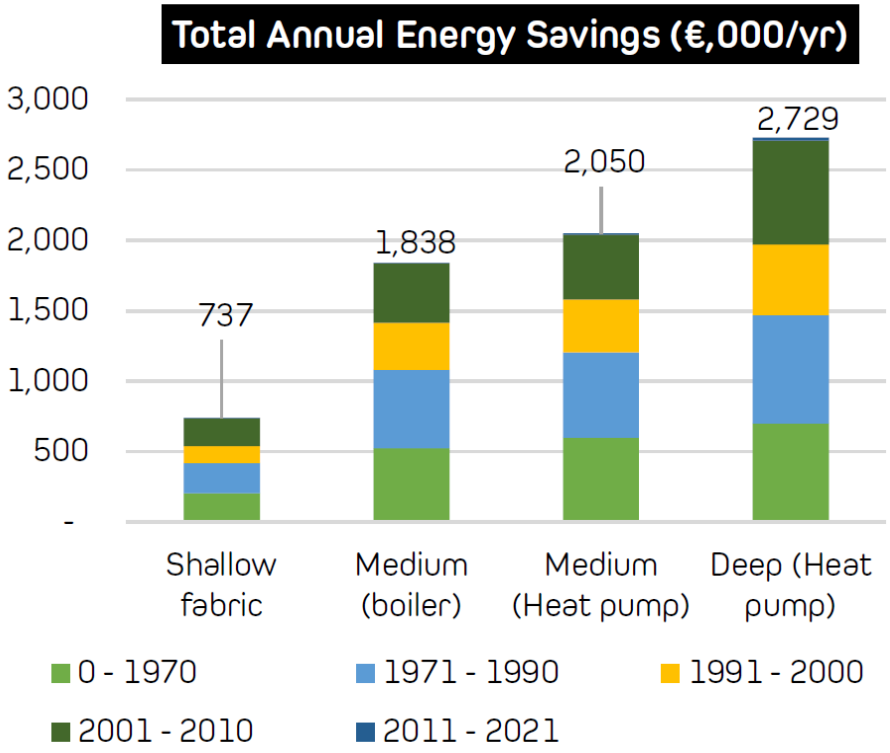


Figure 13 – Total Annual Energy Savings in millions of Euros per year versus baseline conditions if each scenario was adopted by the SEC

Energy Cost per dwelling

On an individual homeowner level, the fuel costs arising from energy usage show significant reductions on an annual basis, with the potential to save almost €900 annually if implementing upgrades in their home that align with the Deep (Heat Pump) scenario.

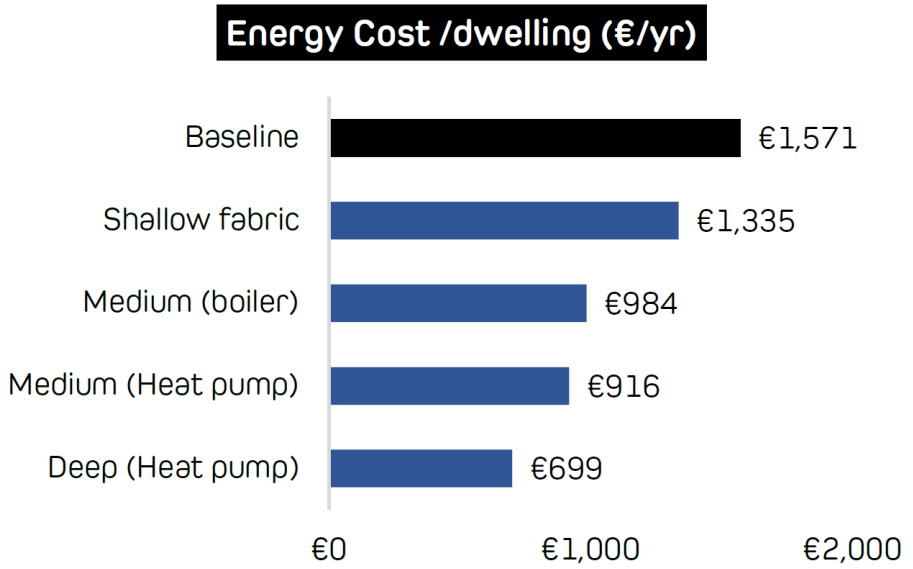


Figure 14 – The average annual energy cost per dwelling under each of the four scenarios

As energy costs look set to continually rise, it is quite likely that the potential savings for both individual homeowners and the community as a whole would also increase under the four scenarios above. It would be hoped that this would create both a more environmentally and economically sustainable community.

RetroKit Case Studies

From the BER Research tool, RetroKit creates a set of "typical" archetype dwellings (up to 240 archetypes in total). The archetypes are classified based on 5 age bands, 4 dwelling types, 4 main space heating fuels and 3 main external wall types.

RetroKit then determines how many of each of the archetype dwellings are in the Trim SEC. The CSO Small Area data is utilized to determine how many dwellings are in the study area as well as percentage of these dwellings in each age band and fuel type. As the CSO data does not indicate the dwelling types in sufficient granularity or the wall type, the BER small area data is used to determine the percentage of dwellings belonging to each dwelling type and wall type.

As neither the CSO or BER small area data detail exactly how many dwellings are in each of the 240 archetypes, RetroKit uses the percentage of dwellings in each age band, each dwelling type, each fuel type and each wall type to determine the spread of dwellings across the 240 archetypes.

The software then deduces the most common property types in the community based on their percentage spread across the study area. This provides most homeowners across the community with a case study very similar to their own dwelling. In the case of the Trim SEC, six common property types were selected. An example of one of these case studies is shown in the following pages, with the remainder contained within the Appendices.

Table 9 – Trim SEC RetroKit dwelling selection

Age Band	Dwelling Type	Main fuel type	Main wall type
1971 - 1990	Detached house	Heating oil	Cavity
1991 - 2000	Semi-detached house	Gas or Liquid Petroleum Gas	Cavity
2001 - 2010	Detached house	Heating oil	Cavity
1971 - 1990	Terraced house	Gas or Liquid Petroleum Gas	Cavity
1971 - 1990	Detached house	Heating oil	Solid or hollow
<1971	Semi-detached house	Heating oil	Solid or hollow

Please be aware that due to the fluid nature of grant schemes, RetroKits' software does not take into account the money that homeowners can earn from grants that would fund the undertaking of the measures outlined in the Home Upgrade Plans. This means that the costs for residents of upgrading their homes and community as a whole, are likely to be notably lower than the costs outlined by RetroKit in their calculations

Glossary of RetroKit Terminology

Although all efforts have been made to keep the language in the RetroKit Home Upgrade Plans non-technical through infographics and normal language, it is not always possible. In order to mitigate against this, we have provided a glossary of key terms used through-out the Home Upgrade Plans along with their meaning.

Table 10 – Glossary of RetroKit Terminology

Name in HUPs	Description
No fill to FF	*Cavity wall insulation to unfilled cavity wall*
Partial to FF	*Cavity wall insulation to partially filled cavity wall*
No insulation to 300 mm	*300 mm loft insulation at ceiling level where no insulation exists*
70 mm to 400 mm	*400 mm loft insulation at ceiling level where 70mm insulation already exists*
Shallow sealing	*Shallow sealing of draughts for airtightness*
Chimney draft limiter	*Fit chimney draft limiter to open fire*
Open fire to wood fuel stove	*Change open fire for high efficiency wood fuel stove*
Install LED lighting	*Fit low energy lighting throughout property*
Solid + 100 mm EWI	*100 mm external wall insulation to solid wall*
CWI + 100 mm EWI	*Cavity wall insulation and 100mm external wall insulation*
Full window replacement to DG	*Replace windows with double glazed windows*
Door replacement	*Replace door with highly insulated door*
Install lagging jacket & insulate pipes	*New lagging jacket to hot water cylinder. Insulate pipework to hot water tank*
New gas boiler	*New high efficiency gas system boiler*
New oil boiler	*New high efficiency oil system boiler*
Install fully integrated controls	*Fit new heating controls*
El to air to water heat pump	*Install new air to water heat pump*
To low temperature radiators	*Change existing radiators to low temperature radiators*
Replace with factory insulated tank	*Replace hot water cylinder with new factory insulated model*
70 mm bet rafters to 50 mm dry lining	*50 mm internal insulation to sloping roof with 70mm existing insulation*
Uninsulated rafters to 50 mm dry lining	*50 mm internal insulation to sloping roof with no existing insulation*
Deep sealing	*Extensive sealing of draughts for airtightness*
To DCV	*Fit demand control ventilation system*
Full window replacement to TG	*Replace windows with triple glazed windows*
Insulate primary pipework	*Insulate primary pipework - from boiler to manifold and hot water tank*
Install 2kWp solar PV	*Install 2kWp solar electric panels*

Housing Upgrade Plan

Rural

Detached house

133m2

Built: 1925

Heating oil

Your home energy upgrade will give you

- More comfort
- Money saved
- Healthier home
- Warmer home
- Better for our planet

How you can achieve this

	Current	Shallow fabric	Medium boiler	Medium heat pump	Deep heat pump
BE	E	D2	B3	B1	A3
Comfort Level					
Roof					
External Wall					
Windows					
Doors					
Floor					
Draughts					
Main Heating					
Water Heating					
Heating Controls					
Lighting					
Ventilation					

Your options to achieve a more comfortable home

Shallow fabric

BER:	Fuel Bills:	Environmental Impact:	Payback:
D2	↓ €-372/yr	↓ -2776 kgs CO_2/yr	19 yrs

	Cost	Impact
No insulation to 300 mm	€2277	★ ★ ★
Shallow	€476	★ ☆ ☆
Chimney draft limiter	€187	★ ☆ ☆
Open fire to wood fuel stove	€4255	★ ★ ☆
Install LED	€125	★ ☆ ☆
Energy credits	€448	
Total investment	€6873	

Your next 5 easy steps to a more comfortable home

Arrange a home energy survey:

Get quotes for the work

Appoint a contractor

Complete upgrade

Get a warmer home

Your options to achieve a more comfortable home

Medium boiler

BER:	Fuel Bills:	Environmental Impact:	Payback:
B3	€-1401/yr	-7797 kgs CO_2/yr	28 yrs

	Cost	Impact
Solid + 100 mm	€21867	★ ★ ★
No insulation to 300 mm	€2277	★ ★ ☆
Shallow	€476	★ ☆ ☆
Chimney draft limiter	€187	★ ☆ ☆
Full window replacement to DG	€6602	★ ☆ ☆
Door replacement	€2082	★ ☆ ☆
New oil boiler	€2575	★ ★ ★
Open fire to wood fuel stove	€4255	★ ☆ ☆
Install fully integrated controls	€1192	★ ★ ☆
Install LED	€125	★ ☆ ☆
Energy credits	€1754	
Total investment	€39889	

Your next 5 easy steps to a more comfortable home

1. Arrange a home energy survey:
2. Get quotes for the work
3. Appoint a contractor
4. Complete upgrade
5. Get a warmer home

Your options to achieve a more comfortable home

Medium heat pump

BER:	Fuel Bills:	Environmental Impact:	Payback:
B1	€-1404/yr	-8562 kgs CO_2/yr	34 yrs

	Cost	Impact
Solid + 100 mm	€21867	★ ★ ☆
No insulation to 300 mm	€2277	★ ☆ ☆
Shallow	€476	★ ☆ ☆
Chimney draft limiter	€187	★ ☆ ☆
Full window replacement to DG	€6602	★ ☆ ☆
Door replacement	€2082	★ ☆ ☆
El to air to water heat pump	€8582	★ ★ ★
Open fire to wood fuel stove	€4255	★ ☆ ☆
To low temperature radiators	€3576	★ ☆ ☆
Install LED	€125	☆ ☆ ☆
Energy credits	€2705	
Total investment	€47329	

Your next 5 easy steps to a more comfortable home

1. Arrange a home energy survey:
2. Get quotes for the work
3. Appoint a contractor
4. Complete upgrade
5. Get a warmer home

Your options to achieve a more comfortable home

Deep heat pump

BER:	Fuel Bills:	Environmental Impact:	Payback:
A3	€-1602/yr	-9320 kgs CO_2/yr	38 yrs

	Cost	Impact
Solid + 100 mm EWI	€21867	★ ★ ☆
No insulation to 300 mm	€2277	★ ☆ ☆
Deep sealing	€2965	★ ☆ ☆
Chimney draft limiter	€187	★ ☆ ☆
Full window replacement to TG	€7922	★ ☆ ☆
Door replacement	€2082	★ ☆ ☆
To DCV	€3576	☆ ☆ ☆
El to air to water heat pump	€8582	★ ★ ★
Open fire to wood fuel stove	€4255	★ ☆ ☆
To low temperature radiators	€3576	★ ☆ ☆
Install LED lighting	€125	☆ ☆ ☆
Install 2kWp solar PV	€5722	★ ☆ ☆
Energy credits	€2705	
Total investment	€60435	

Your next 5 easy steps to a more comfortable home

1. Arrange a home energy survey:
2. Get quotes for the work
3. Appoint a contractor
4. Complete upgrade
5. Get a warmer home

Energy in Transport

Background

Transport in Ireland is currently deeply dependent on imported fossil fuels. Emissions from transport powered by fossil fuels were by far the largest source of energy-related CO_2 in 2020, as they were responsible for 40% of the total and it is the only sector where CO_2 emissions have grown since the end of the recession in 2012. Road transport specifically accounts for 96% of all greenhouse gases associated with transport, so a modal shift to more sustainable forms of transport is critical.

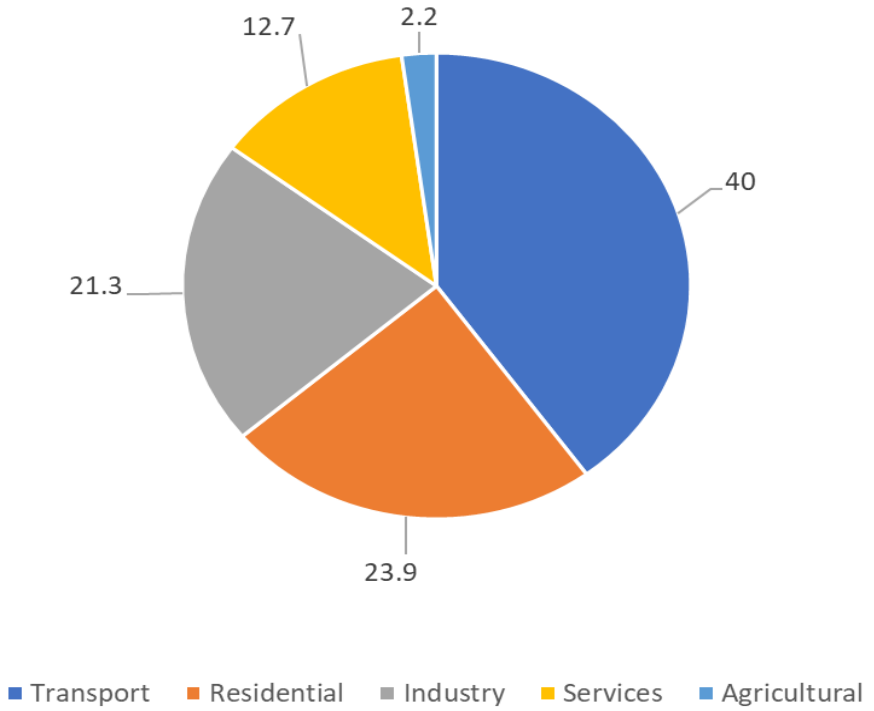


Figure 15 – Percentage share of Energy Related CO_2 by sector for 2020 in Ireland

The Climate Action Plan stipulates that there must be a 42-50% reduction in emissions from the transport sector by 2030 if Ireland is to meet its Climate targets.

In order to achieve these emission reductions, it's clear that a transition towards more sustainable forms of transport is required. To realise this transition, many forms of transport options must be maintained, planned, and provided for the region. This ranges from safe and accessible walking and cycle routes, appropriate public transport links serving the needs of residents, to the implementation of appropriate infrastructure to support the electrification of private car and fleet vehicles.

The standout targets for the Transport sector as part of the Climate Action Plan are to:

- Provide an additional 500,000 daily public and active transport journeys
- Electrify 845,000 passenger cars
- Electrify mass transportation with up to 1,500 Electric Buses

This will necessitate a change in the traditional 'road hierarchy' which has dominated Irish roads for years, starting with active travel and then public transport being encouraged over the private car and the final stage of electrifying the fleet.

Ireland's rapidly growing economy in recent years has brought with it urban sprawl and low-density development which has locked in unsustainable travel patterns and a reliance on private cars bringing with it entrenched behavioural patterns that will not be an easy challenge to overcome.

The impact of the COVID-19 pandemic, with the introduction of severe travel restrictions and greater remote working practices is estimated to have resulted in a reduction of approximately 16% of transport emissions (excluding aviation) in 2020 compared to 2019 levels. The pandemic has shown that large scale behaviour change is achievable and that new patterns of mobility and working can play a part in the transition to a more sustainable transport system.

Method

An analysis of the means of transport for workers and students as well as the transport fuel mix in the catchment area of Trim SEC has been carried out based on data from the Central Statistics Office (CSO).

SEAI's corresponding energy usage, prices and emission factors for various forms of transport as of 2020 were applied to calculate the total spend and CO_2 emissions for various sources of fuel for vehicles in the catchment area.

Supplementary to the publicly available data, two surveys were issued by the Trim SEC and promoted through local schools and social media channels. These surveys focused on attitudes and usage towards various forms of transport for school going children and the general population of the SEC. The most notable results have been included within this report, but all results can be viewed in the supplementary Collated transport surveys document. Whilst the level of response to each of the questions within the survey varied, 257 people responded to the School Transport survey, with 60 doing the same with the General Transport survey.

Results and Analysis

Commuting to work

Commuting to work by private car is the primary method of transport in the Trim SEC with 72.9% of workers either driving or being driven by car.

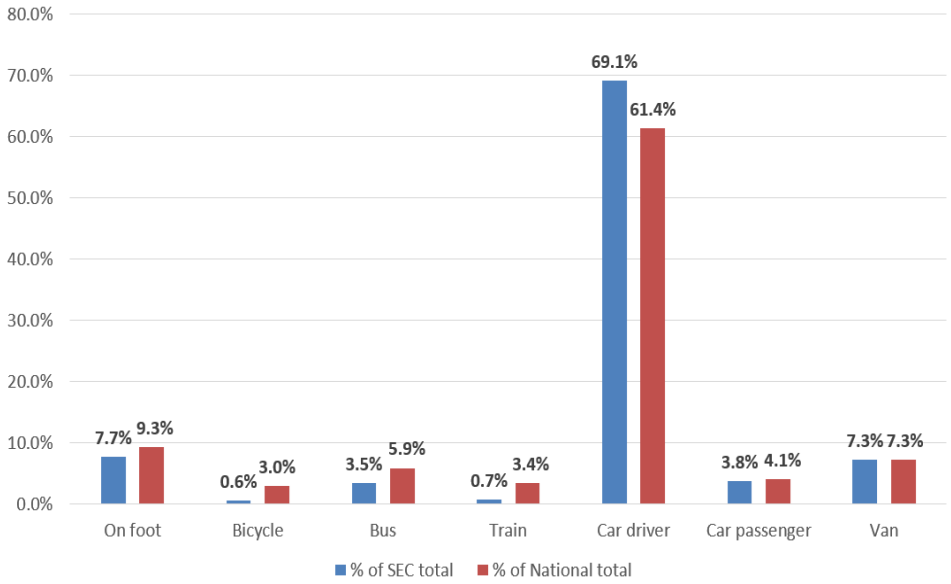
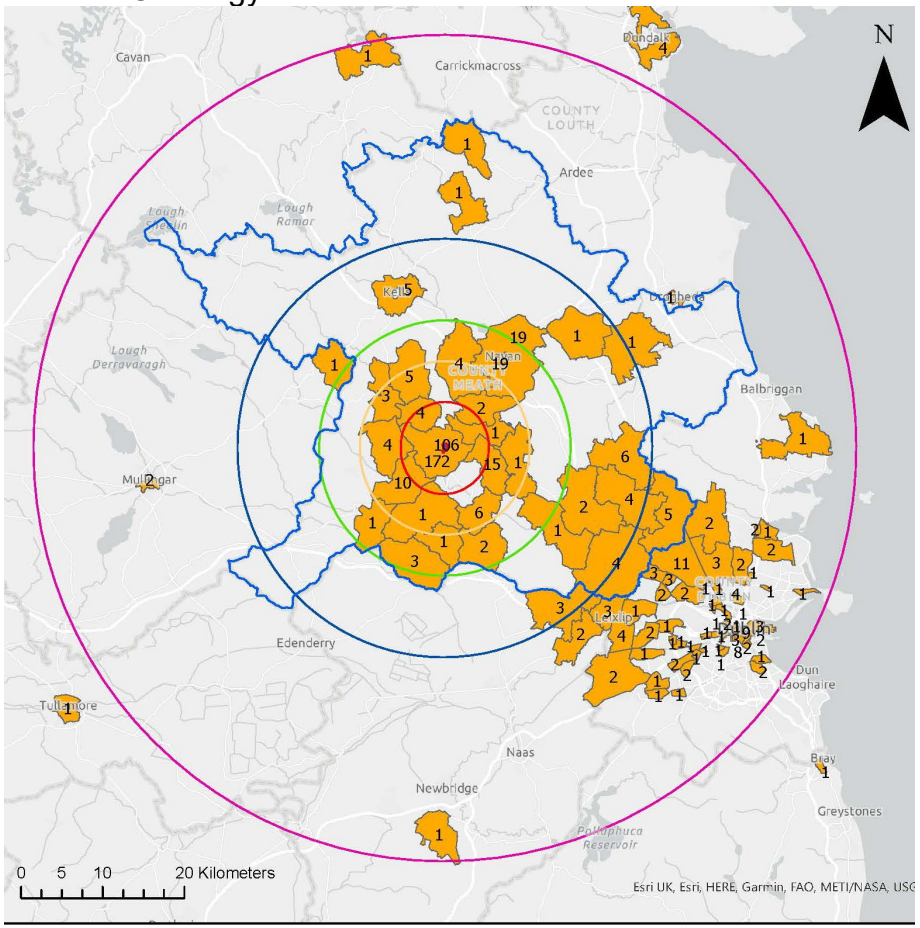


Figure 16 – Primary forms of transport used to commute to work

Trim lags behind national averages in both active and public transport usage for commuting to work. To tackle these low levels and shift more commuters away from driving traditional fossil fueled cars, the SEC could try to encourage those commuters who travel within a 15km radius of the town to utilize the bus services to the surrounding area. The sizeable amount of commuters in the figures below that are travelling <15km to work gives further support to this strategy.

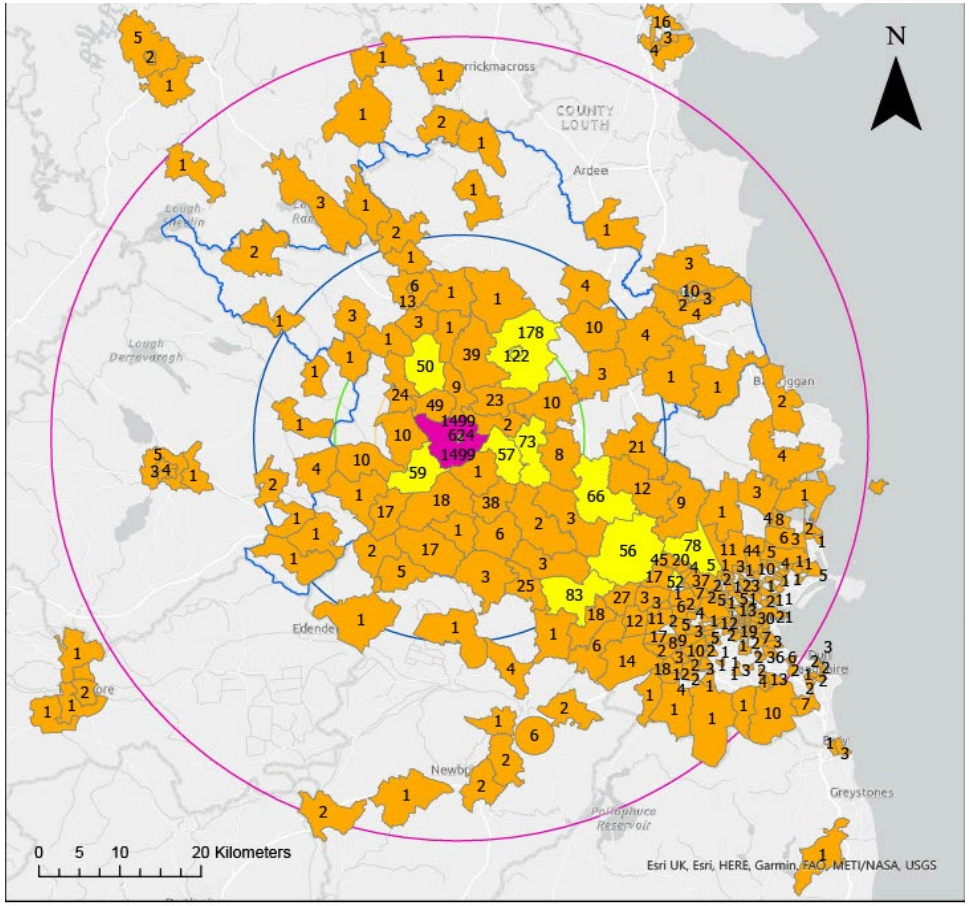


Census 2016 Place of Work, School or College - Census of Anonymised Records (POWSCAR) illustrates the movement of individuals living in Trim who travel for Work, School or College. The information is based on the 2016 census data.

The number in the highlighted Electrical divisions indicate the number of individuals commuting daily to each electrical division from Trim Urban.

- Co. Meath Border
- 50km
- 25km
- 15km
- 10km
- 5km
- Trim Urban Zone

Place of Work, School or College Census of Anonymised Records (POWSCAR). Travel Destinations from **Trim Urban**



Census 2016 Place of Work, School or College - Census of Anonymised Records (POWSCAR) illustrates the movement of individuals living in Trim who travel for Work, School or College. The information is based on the 2016 census data.

The number in the highlighted Electrical divisions indicate the number of individuals commuting daily to each electrical division from Trim Urban.

- Co. Meath Border
- 50km
- 25km
- 15km
- 10km
- 5km

COUNT

- <Null>
- 50
- 52
- 56
- 57
- 59
- 66
- 73
- 78
- 83
- 122
- 178
- 624
- 1499
- <all other values>
- Trim Rural

Place of Work, School or College Census of Anonymised Records (POWSCAR). Travel Destinations from **Trim Rural**

The CSO 2016 Place of Work, School or College – Census of Anonymised Records (POWSCAR) illustrates the movement of individuals living in Trim Urban and Trim Rural Electoral Divisions. An analysis of the information when presented using Geographic Information Systems (GIS) illustrates the influence of large urban centres on the movement of individuals.

Although there is a significant number of journeys outside of the county, the majority of journeys originating from Trim Urban and Trim Rural are within a distance of 25kms. The electrical divisions illustrated in yellow in the Trim Rural analysis indicate the main destinations where greater than 50 individuals travel each day.

The average distances traveled are well within the single charge capacity of a modern electrical vehicle and therefore should not be seen as a barrier to the acceptance of this technology.

The POWSCAR information also highlights the number of individuals commuting into Trim Urban from Trim Rural. This number is quite significant and further detailed analysis would be recommended to determine if additional public transport services could economically service this catchment area and provide an alternative mode of transport for individuals who need to commute to Trim Urban.

Reducing reliance on the private car is difficult, particularly in low density, dispersed population such as Ireland's. Sustainable transport is among the greatest challenges for areas outside of the major urban hubs, particularly in a town like Trim which currently does not have a railway station.

Services such as LocalLink operate successful services to isolated and vulnerable people within the community, as well as offering an alternative means of transport within the region. Ensuring regular, consistent, and reliable operation of such services can help in increasing the number of locals who will use it. It is also important to circulate the operation of such services through as many means as possible such as social media, local newsagents etc.

COVID-19 and commuting to work

The impact of COVID-19 on the nature of transport in Trim cannot be understated and will have changed significantly in the last two years, with a greater shift to home-based working and education thus leading to a reduction in car usage.

The CSO have released information compiled during the COVID-19 crisis. The data was collected as part of the Q2 Labour Force Survey data collection and refers to data collected from households in April 2020. The figures indicated that of the 47% of the population who have had their employment impacted by COVID-19, just over a third (34%) started remote working from home. The age group 35-44 years is the age group who most used remote working as a result of the COVID-19 pandemic.

Reducing car journeys through remote working

The recent enforced changes have created a national experiment in the concept of hybrid or remote working models which in many cases have been seen as being successful. Many office-based jobs can be based partly or on a full-time basis at home or within remote office hubs within the community. A reduction of 40% in work commutes could be achieved by working remotely 2 days a week, which would mean significant progress in reducing transport emissions by 42-50%.

Trim SEC could explore the potential for smart remote working hubs within existing community building infrastructure or as additions onto community buildings with childcare and after school facilities. It can also be used as an opportunity to give derelict buildings within the community a new lease of life.

The Building Block [7] in Sligo town is an excellent example of this, which is a shared working space that prior to its development in 2017, had been unused for 10 years. Key elements which will be required to make this successful are comfortable buildings with high-speed broadband and shared canteen facilities. This type of development has been seen to have a positive impact on the greater village community by increasing footfall in cafes and local shops as well as improving individuals life/work balance.

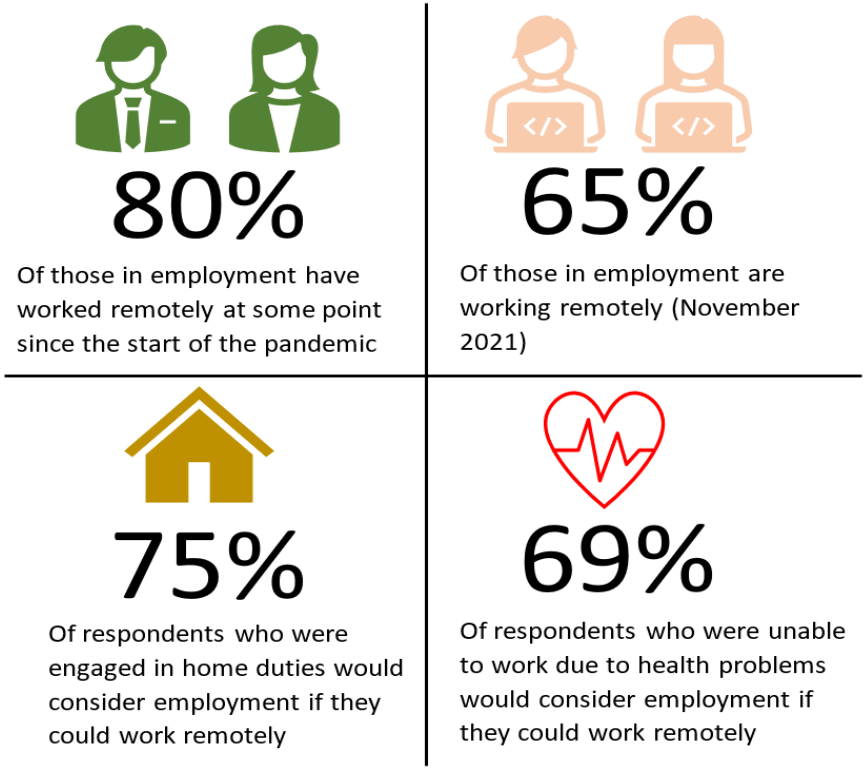


Figure 17 – Results from the CSO 'Our Lives Online: Remote Work' survey from November 2021

[7] https://tinyurl.com/9d756vrx

General Transport survey

As part of the EMP, two surveys were circulated by the Trim SEC to uncover residents' attitudes and opinions regarding various forms of transport. This section will illustrate the most noteworthy results from the survey. As Figure 18 illustrates, respondents to the General Transport survey indicated that the primary reason they drive to work is because they have no alternative. This is difficult to address as it goes beyond the Trim SEC boundary and is intrinsically linked with the regional disparity in industry and large employers, particularly in towns within the Dublin commuter belt.

The 2nd most common option (It's quicker) ties in with general convenience. Naturally people want to get to and from their place of work as soon as possible and often a car is the quickest way of doing this. Again, reversing this statistic would require significant upheaval in the traditional road hierarchy and needs a coordinated regional, if not national effort at the very least. Therefore, this is a difficult issue to solve a local level.

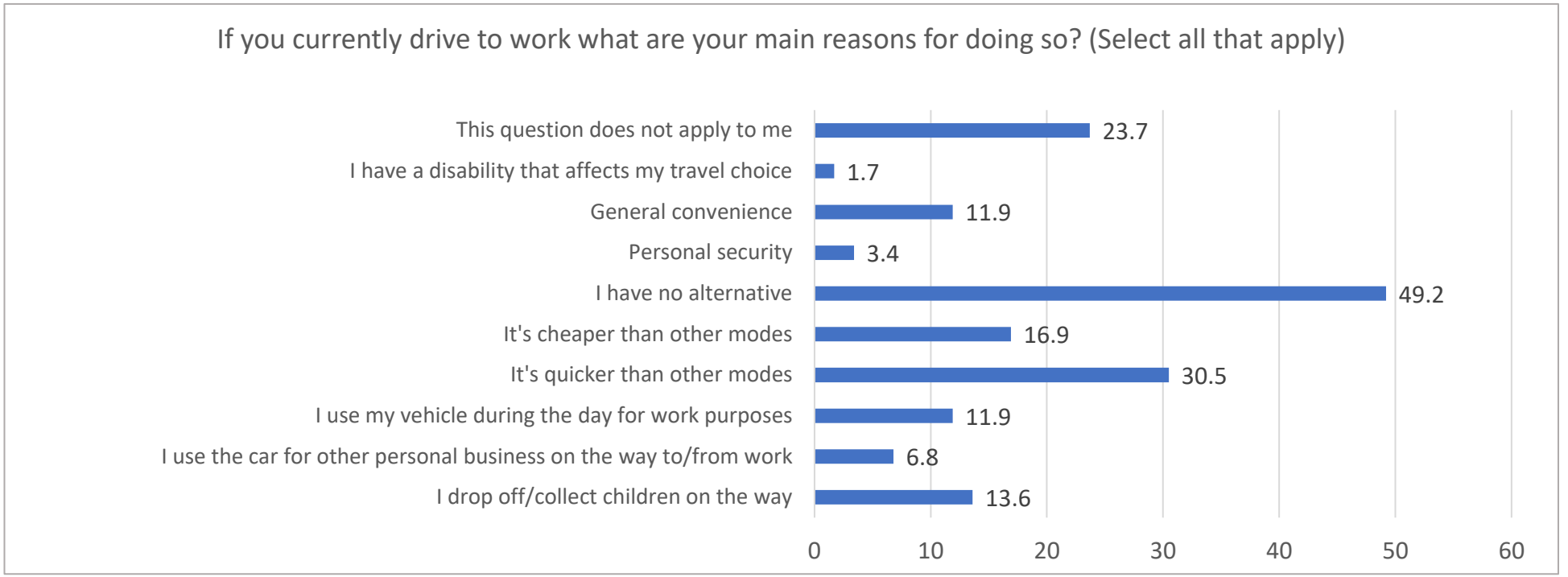


Figure 18 – The reasons selected by 59 respondents when surveyed on why they choose to drive to work

The answers given by respondents when questioned about why they don't use public transport reflects the previous question. Respondents indicated they don't use public transport because it's not frequent enough (41.8%).

Many respondents indicated that bus fares are too expensive although opinions on this may change in the coming months as fuel prices for cars start to impact households, coupled with the 20% decrease in selected public transport services announced from April 2022 onwards.

Conversely services can be reflective of demand in the local area. Residents of the Trim SEC who wish to see more bus services would need to prove that there is demand for them to make them economically viable.

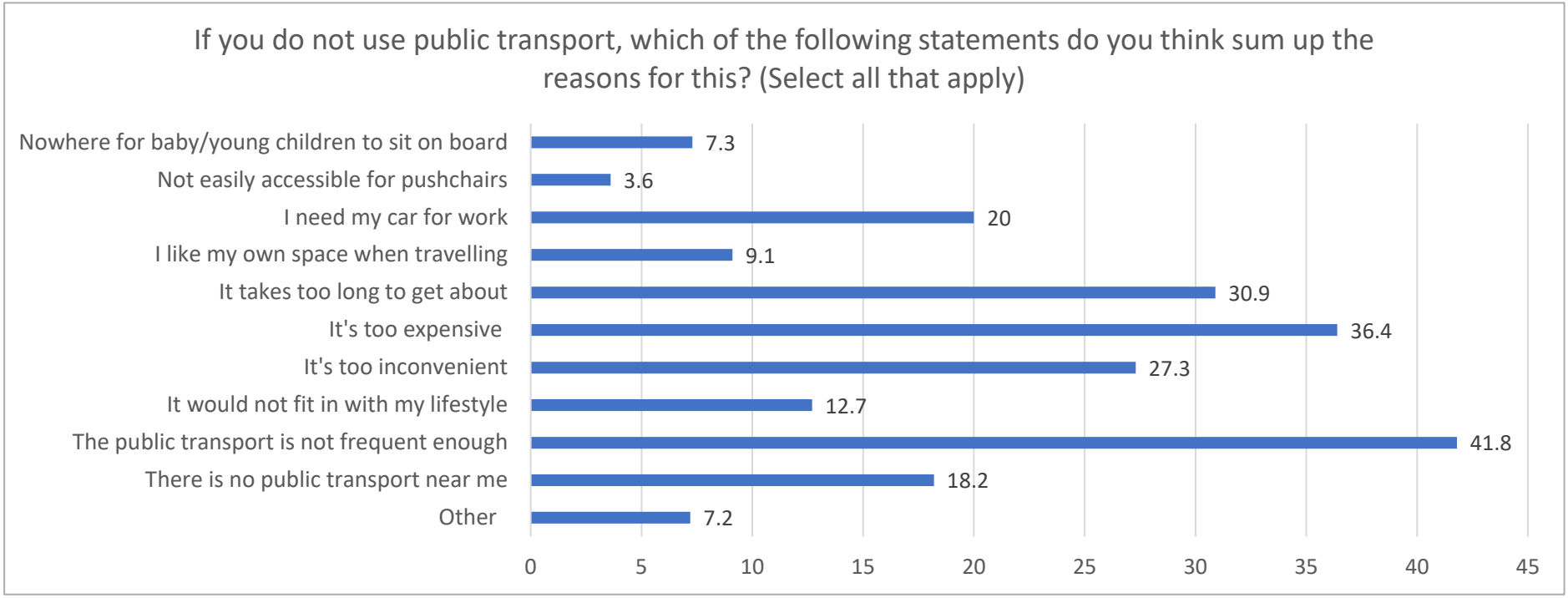


Figure 19 – The reasons selected by 55 respondents when surveyed on why they do not choose public transport for driving to work

The fact that 'Nothing would encourage me to choose active transport for work' is the second most popular response in Figure 20 would be concerning for individuals associated with the Trim SEC who wish to see more investment in active transport. Of course, this survey does not represent the whole community but if over a third of individuals will not use active transport to commute irrespective of the amount invested in it, then it becomes an increasingly difficult investment to justify.

Concerns about safety when cycling or walking to a place of work or education, which were mentioned frequently throughout the school transport survey were a common answer from respondents here. This signals a desire from respondents for more separated footpaths/cycle lanes from traffic with physical barriers. This does not have to take the form of bollards or other heavy segregation methods, as studies have shown that even vegetation pots separating traffic from cyclists and walkers are effective in increasing active transport safety and usage [8].

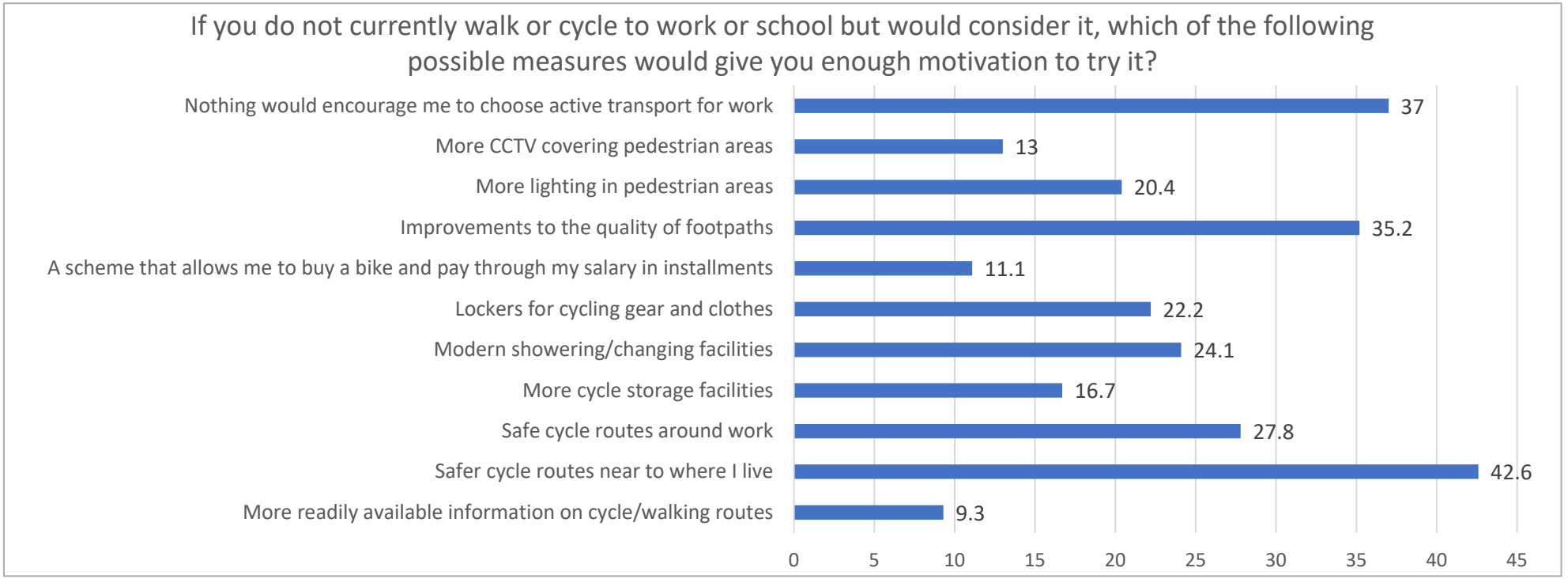


Figure 20 – The reasons selected by 54 respondents when surveyed on what would motivate them to walk or cycle to work if they don't currently

[8] Urban Movement (2015), "Royal College Street, Phase 1, Post Implementation Review", http://www.urbanmovement.co.uk/uploads/1/4/1/9/14194615/cycling_in_the_city_v1.0_final.pdf

The theme of cycling not being a popular choice continues. 44% of respondents indicated that they never cycle. This raises a chicken and egg type of scenario. If the Trim area were to invest in upgrading their cycle infrastructure would people cycle more? Or does it require a strong cycling presence to justify such investment? This question encompasses those respondents who cycle for leisure and other purposes, not just work, so the findings do not suggest that there would be much appetite to cycle in the community.

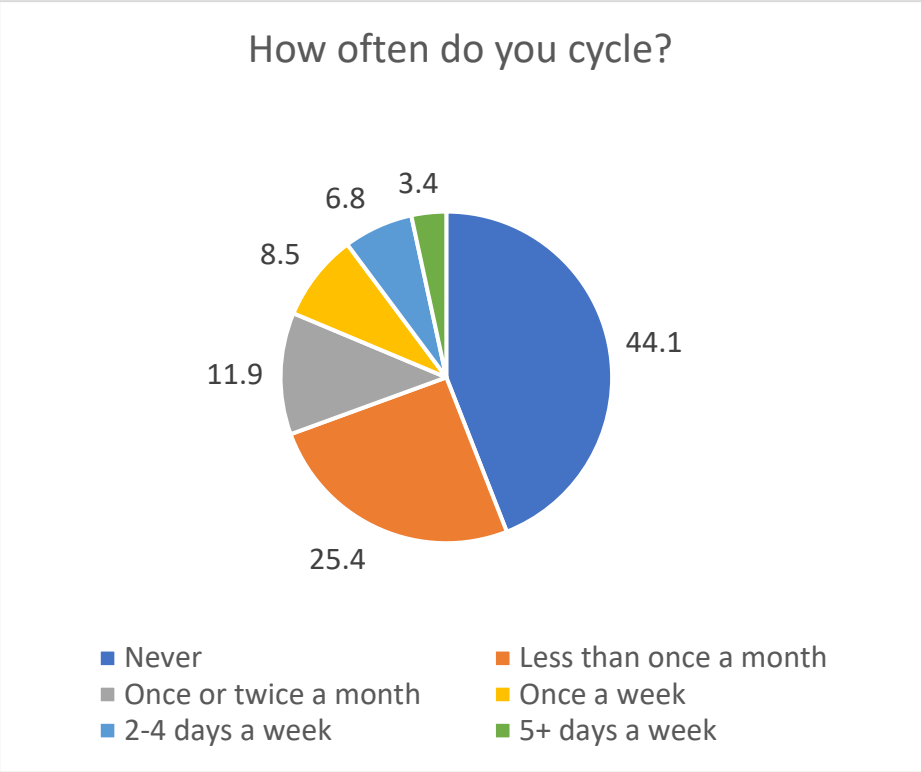


Figure 21 – The reasons selected by 59 respondents when surveyed on how often they cycle

Commuting to school or college

The outcome is similar for students commuting to primary, secondary and college education. Naturally we would expect the car to dominate the uptake for primary school children, so this slightly skews the results. However, the community's low usage of public transport continues amongst the student population, with the Trim SEC's usage over 25% lower than the national average.

This may be seen as a cause for concern but could also be viewed as a significant opportunity, as the community could try to address this by lobbying their local councilors and TDs if they can prove there is demand for the service.

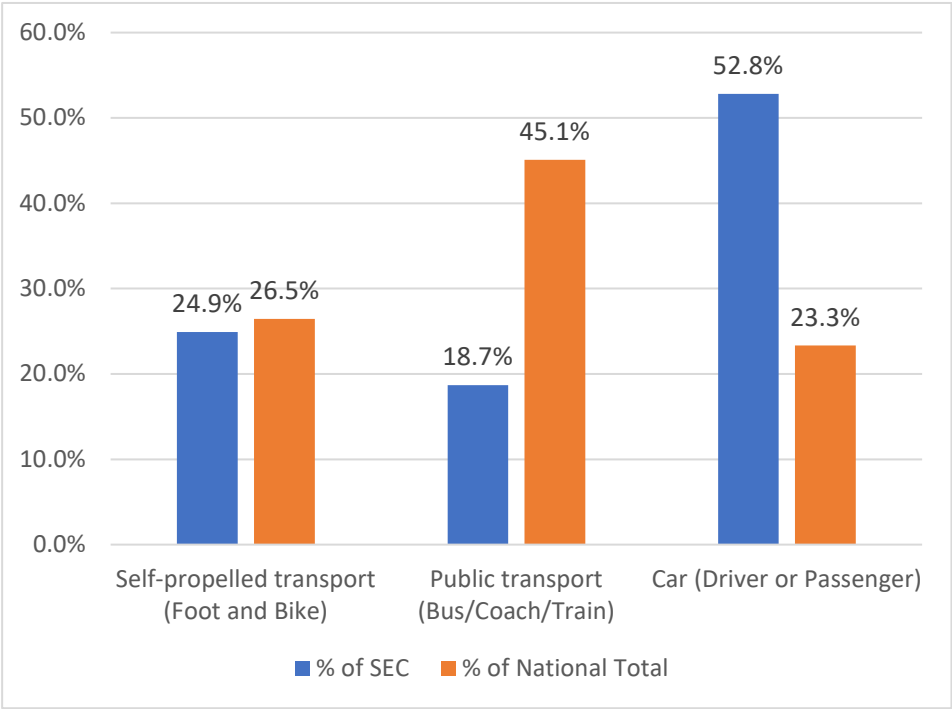


Figure 22 – Primary forms of transport for primary, secondary and college students

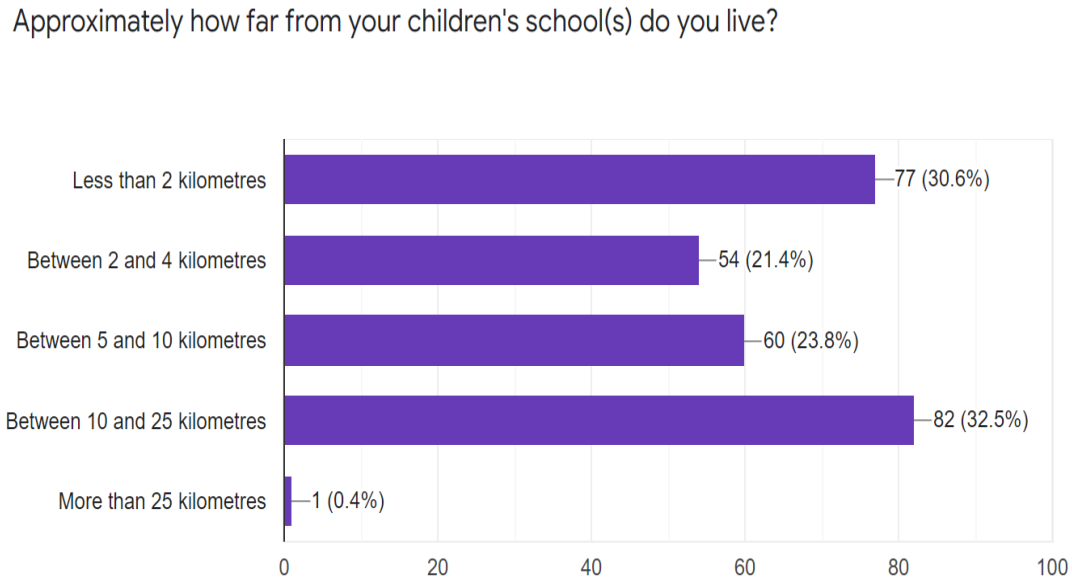
For higher level students, who may be travelling Dublin to attend 3rd level education, the train from the neighboring town of Navan should be heavily promoted as a means of commuting, especially as a 'park-and-ride' style commute, where passengers drive to and from the station to take the train.

Trim has a respectable level of students who either walk or cycle to school, sitting just below the national average. To increase this rate the SEC could look to seek funding or grants in order to improve the active travel infrastructure in their community so that walkways and cycle paths are safer for students.

For example, The Safe Routes to School (SRTS) Programme launched in March 2021 and was open to all schools in Ireland to apply for active travel funding and delivery. Over €15 million was provided in Round 1 of funding to accelerate the delivery of walking and cycling infrastructure on key access routes to schools and on school grounds.

School transport survey

In the School transport survey, over half of the parents surveyed (52%) lived between 0-4km from school which is a suitable distance to engage in active transport or utilize a bus service. Conversely, an even greater number of parents (56%) live over 5km from their children's schools which limits opportunities for active transport. This suggests that an adequate bus service would be a priority for parent's when opting for alternatives to a car for transporting their children to/from school.



The results of the question regarding how respondents' children usually travel to school (Figure 24) suggests that efforts should be focused on encouraging children to walk to school that live close enough to do so, particularly encouraging those students who walk occasionally/once or twice a week to become more regular walkers.

It is always likely that Car/Van would top these survey results for a multitude of reasons, so this isn't a surprise, but by encouraging alternative methods such as active transport, the number of children who use that car five times a week to travel to school could be significantly reduced.

There are also a significant number of students who use the bus to travel to school on a daily basis which is encouraging for the Trim SEC. In order to maximise the number of students using the bus service further, Government subsidies for this service are likely to be required. This is likely only to occur should sufficient pressure from parent groups be applied on local councilors and their TDs.

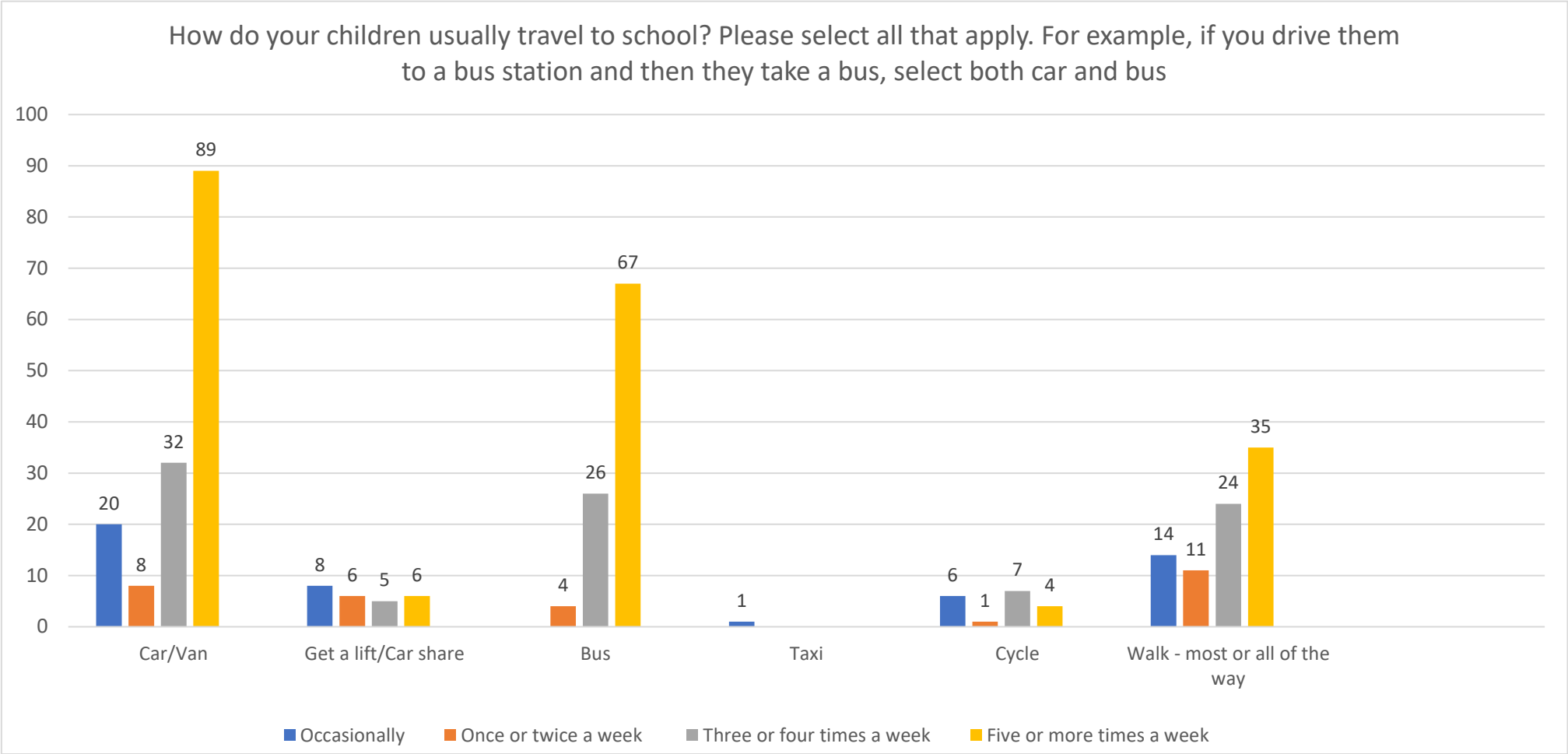


Figure 24 – This bar chart provides a breakdown of the various forms of transport taken by children going to and from school

The most common reasons respondents provided for their child not walking or cycling to school revolved around the distance of their home to the place of education, safety concerns and poor weather. This may give further credence to the argument that walking routes for those students living within 2km should be prioritised.

This distance is supported by previous studies into Irish students' commute to school, which showed that among Irish adolescents (15-17 year olds) the criterion distance for walking and cycling to school was ≤ 2.4 km [9]. Other European studies have shown that this distance increases with age and the thresholds for walking are lower for children beginning secondary school (1.5km) [10].

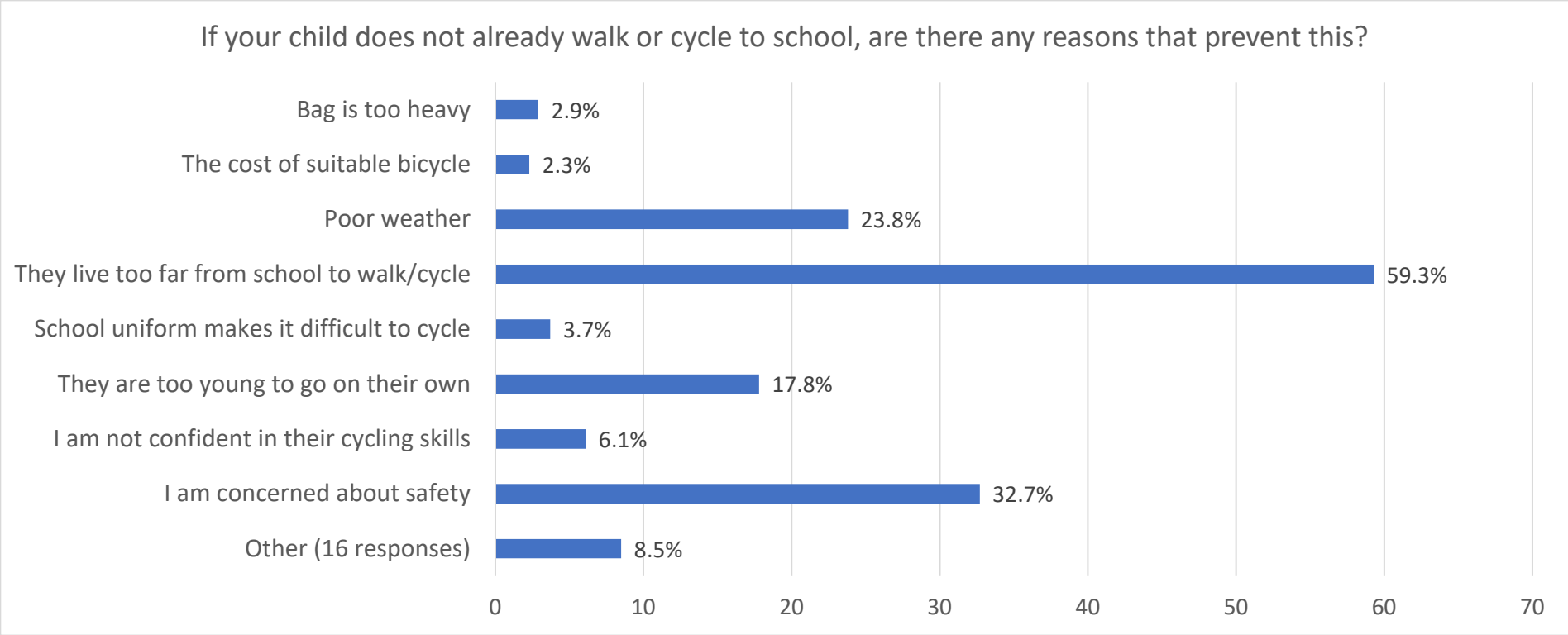


Figure 25 – This bar chart provides a breakdown of why respondents children do not cycle or walk to school

[9] Nelson, N.M., Foley, E., O'Gorman, D.J. et al. Active commuting to school: How far is too far?. Int J Behav Nutr Phys Act 5, 1 (2008). https://doi.org/10.1186/1479-5868-5-1

[10] Chillón, P., Panter, J., Corder, K., Jones, A.P. and Van Sluijs, E.M.F., 2015. A longitudinal study of the distance that young people walk to school. Health & place, 31, pp.133-137.

On a scale of 1-5 with 1 equalling 'Very uncomfortable' and 5 equalling 'Very comfortable', 63% of respondents indicated they would be very uncomfortable (47%) or uncomfortable (16.3%) with their children cycling to school. This could suggest that parents don't feel confident in the cycling infrastructure in the town in terms of protecting their children's safety, i.e. lack of bollards separating cycle path from road or that the cycle lane is connected to the road with no physical barrier.

Part of the survey also allowed parents to make additional comments about transport in Trim in a free text box. As can be seen in the transport survey document and later in this section, many of the responses refer to the danger of traffic in the town. This may indicate that more initiatives that reduce the speed of drivers such as speed ramps, lower speed limits, speed cameras could decrease the perceived danger of traffic in the town, increasing parents comfort level when letting their children cycle to school

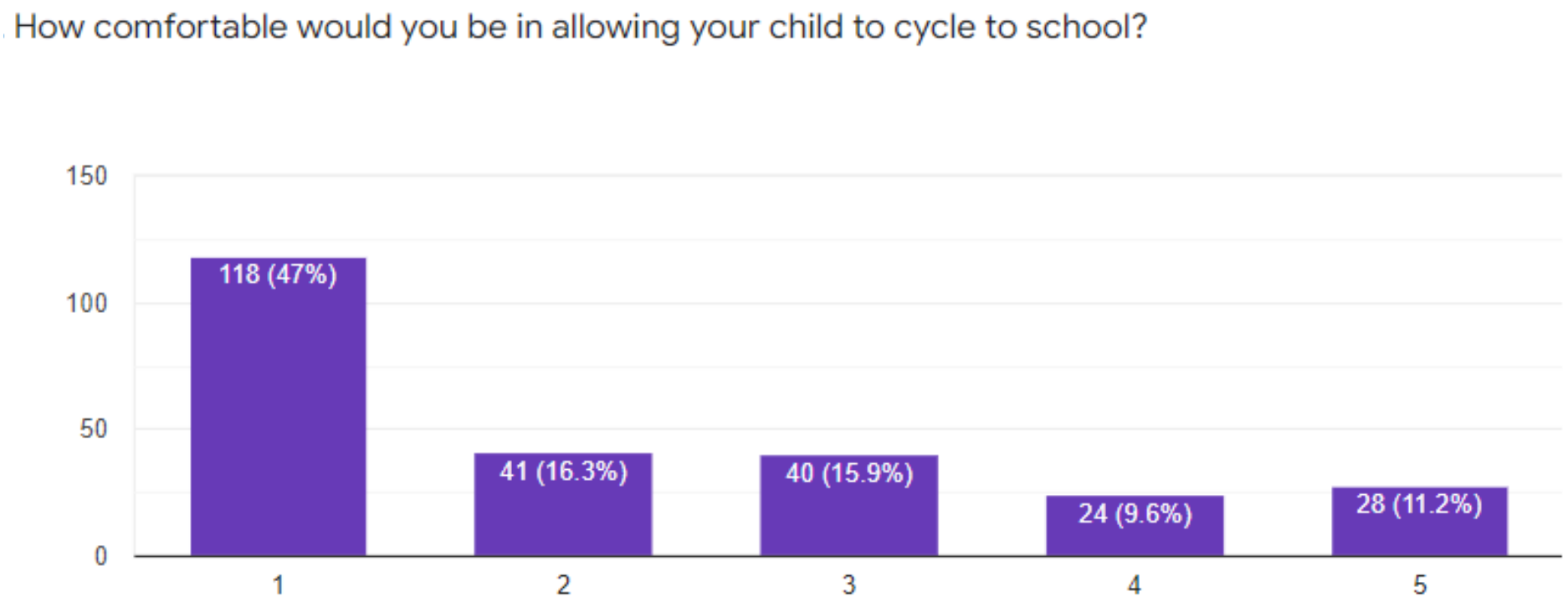


Figure 26 – On a scale of 1 to 5, with 1 equaling 'Very uncomfortable' and 5 equaling 'Very comfortable' respondents rated how comfortable they would be allowing their child cycle to school

To ease concerns about their children's safety when using active transport, the survey asked respondents to comment on their attitudes on 'cycle buses' and 'walking buses'. Over twice as many parents thought their children would not avail of a cycle bus compared to those who did and over 70% wouldn't help run it which suggests a strong lack of support for this concept in the Trim SEC. The same is true for the walking bus, with almost two thirds of respondents saying that they did not think their children would avail of this. However, there was an increase in the number of respondents who were interested in running this service. Perhaps this concept would be most suitable for those respondents with children who live within 2km of school (walking distance) and work from home or have flexibility with their working arrangements.

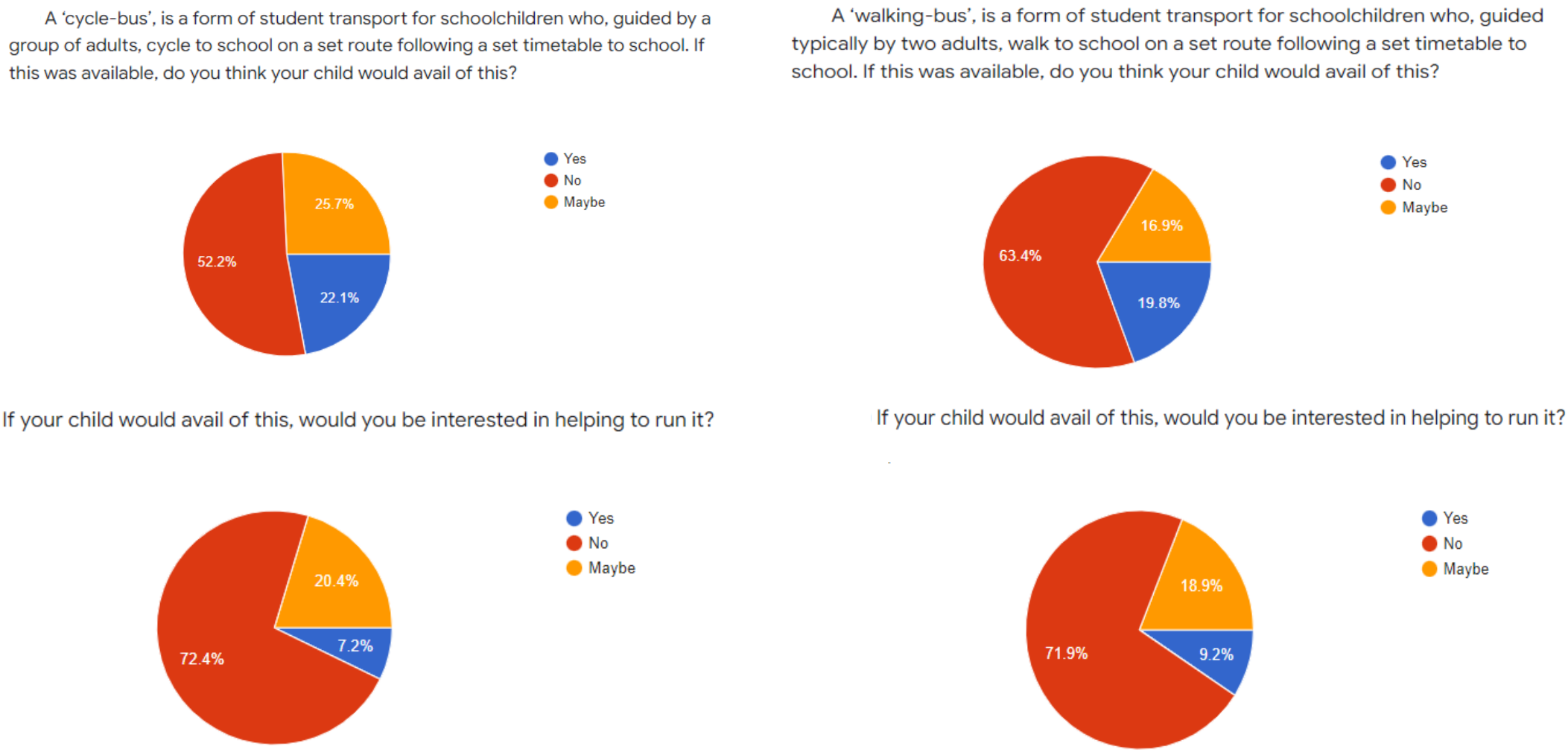


Figure 27 – Parents attitudes in relation towards their children being interested cycle and walking buses and with their willingness to help run them

The final question in the survey allowed respondents a free text box to include any other amendments or improvements to the transport system for schools in the Trim area they would like to see. Many of the respondents' comments in the final question echoed the results from the figures included. The theme of safety, or lack of it, for children when walking or cycling cropped up regularly with one parent stating:

"Simple things like finding her a safe place to cross the R159 means that she cannot be dropped off at our house… secondary school kids could cycle to school, 5.5km isn't far. Just way too dangerous".

Others spoke about inadequate bus services serving their children's needs, with the range and regularity of services being called into question:

"I would love school bus transport - We have been informed that no school bus operates for our school which is unfortunate. We live on a main road which is 5k from the town centre, so it is not practical for my child to walk and completely unsuitable to cycle".

The lack of buses running in the rural hinterland was brought up regularly by respondents and seems to be a real point of concern for some respondents.

The quality of the active transport infrastructure within the Trim SEC also featured regularly, with respondents highlighting a perceived lack of cycle lanes, as well as the design of the cycle lanes currently in use:

"Cycle lanes nearer to road like they have in Netherlands or even in Maynooth and not like in Trim where the cycle lane is on the inside of the footpath and no one uses it"

Insufficient infrastructure for students walking to school was also highlighted as an issue for the Trim SEC. Similar to cycling, there was a demand for additional dedicated walking footpaths:

"there should be a pedestrian crossing between De Granville Ct, Saint Johns, Trim, Co. Meath, which is the entrance to the Gaelscoil & the junction of the road that leads to Marcies Regan's. The children or other pedestrians have no safe way of crossing this road."

These were just a handful of some of the quotes that emerged from the responses provided by parents. The rest can be viewed in the supplementary Collated Transport survey document alongside this report, along with answers to a similar question in the General Transport survey which asked respondents if there any other amendments or improvements to the transport system in the Trim area that they would like to see.

Energy consumption from transport

An analysis of transport related energy consumption was carried out for the Trim SEC catchment areas. The analysis was based upon a statistical analysis of vehicle ownership in the catchment area along with the types of vehicles used and their associated carbon emissions.[11] As already referenced, the Census data shows that the majority of commutes within the Trim SEC catchment area is by car or van.

Table 11 – Means of commuting in the SEC

Commuting to work	No. of people
On foot	307
Bicycle	23
Bus	140
Train	28
Car driver	2751
Car passenger	151
Van	291
Total	**3983**

Based on the information for vehicle ownership within the catchment area, it is possible to calculate the energy consumption and carbon footprint for the transport sector. A national stock breakdown has been used to calculate energy consumption and emissions (56.9% diesel, 42.7% petrol, 0.4% Battery Electric Vehicle (BEV)) based on national average km travelled.

[11] The renewable portion of the fuels has been taken as follows: renewable content of electricity consumed (40% in 2020), 5% of petrol consumption and 7% of diesel consumption (as per the Biofuels Obligation Scheme).

Table 12 – Private Vehicle Transport Energy and CO_2 impacts

		National average annual km	kWh/km (TPER)	gCO_2/km
Car	**Petrol**	12,113	0.73	167
	Diesel	19,681	0.70	167
	BEV	12,958	0.38	65
Motorcycle		2,741	0.41	94
Van		19,787	1.01	243
Truck		44,671	3.47	832

Based on this information and values, a conservative estimate of energy used in transport is shown in Table 13 below.

Table 13 - SEC Transport Energy, CO_2 and Spend

	Electricity	Fossil Fuel	Renewable	Total
Total Primary Energy (kWh)	54,184	35,348,689	2,458,923	37,861,795
Total CO_2 (tonnes)	9.27	8,929	0	8,939
Total Spend (€)	€6,556	€4,572,055	€297,530	€4,876,141

Switch to electrical vehicles

An analysis of the impact of changing 40% of the existing private vehicle fleet to battery electric vehicles is detailed in Table 14. It indicates that a CO_2 reduction of 2,227 tonnes and a reduction in energy spend of approximately €1,020,110 per annum.

These are savings which can be recirculated around in the local economy, creating a more economically sustainable community. If the Trim SEC is struggling to avoid using cars or shift its residents to active or public transport, then a transition to electric vehicles shows that it can have a significant impact on reducing emissions, showing alignment with the Climate Action Plan's targets

Table 14 - SEC Transport Energy, CO_2 and Spend with 40% Electric Vehicles

	Electricity	Fossil Fuel	Renewable	Total
Total Primary Energy (kWh)	5,418,414	22,932,426	1,948,419	30,299,258
Total CO_2 (tonnes)	927	5,785	0	6,712
Total Spend (€)	€655,628	€2,964,645	€235,759	€3,856,031

A significant increase in the availability of long-range electrical vehicles (EV) has made this mode of transport more suitable for rural environments. Electric vehicles will become the dominant mode of privately owner vehicles in the coming decade. The key benefit for the user is the reduced operational costs associated with fuel to power the car. The following fuel costs for the EV are based upon home charging with night rate electricity in 2020.[12]

Table 15 - Comparison of CO_2 impacts and fuel costs based on 250km per week

Vehicle	Weekly fuel cost	Weekly gCO_2
Electric e.g. Nissan LEAF	€2.54	13,800
Petrol equivalent	€21.60	27,200
Diesel equivalent	€15.74	21,800

[12] https://www.esb.ie/our-business/ecars/ecars-cost-calculator

The Trim SEC should consider a public EV awareness event to promote awareness of the suitability of electrical vehicles for medium sized towns. This event should also discuss the supports available from SEAI for electric vehicles purchase, benefit in kind and home charging points.

Although it is a significant investment to purchase an EV, households with 2 vehicles should be encouraged to look at the possibility of having a smaller electric car alongside their first car for shorter journeys as a starting point on the route to electric vehicles.

SEAI provides a series of supports to incentivise the transition from fossil fuel-based vehicles towards electrical vehicles, details of which can be found in the Appendices.

Whilst we anticipate the accelerated growth of a 'second-hand' market to grow in the next five years, given the lower economic status of a chunk of the Trim SEC's residents, for the meantime the Trim SEC should focus on implementing the 'Avoid-Shift-Improve' or ASI model for transport within the community.

Table 16 – Avoid–Shift–Improve Transport model

Pillar	Description	Example
Avoid	Avoid or reduce travel or the need to travel	Transitioning to increased remote working. Walking or cycling where possible.
Shift	Shift to more energy efficient modes	Using public transport such as bus services.
Improve	Improve efficiency through vehicle technology	Moving towards electric vehicles.

Car Sharing/Pooling

Car sharing within a suburban environment can be complex due to the distribution of homes, however many people are likely to be travelling to the same locations on a regular basis, such as on school runs. Car sharing or pooling can reduce the number of vehicle journeys and reduce the cost for both the driver and its occupancy by sharing costs. Although car sharing/pooling does require planning, it does have benefits that include:

- Reduced driving and car maintenance costs
- Social and inclusive
- Suitable for longer distance commutes daily
- Suitable for school runs as the start and finish times are defined.

Commercial/Business

Background

In order to achieve a 51% reduction in Carbon emissions by 2030 and a subsequent 'Climate neutral economy' by 2050, the business community will have to go through a period of transition in the same way as other sectors of the economy. Over the next decade businesses are encouraged to invest in a greener future, through sustainable products, services and business models.

Since this financial crisis, Ireland's economy has shifted from one influenced by the construction sector, to one which is more influenced by SMEs. There are an estimated 160,000 SMEs in Ireland, meaning there is significant potential to reduce emissions within this sub-sector.

Many of the avenues that the commercial/business sector can take to reduce their carbon footprint and move towards a more sustainable model show crossover with the opportunities in the residential sector. However, there are a significant number of commercial processes such as refrigeration within convenience stores, air compressors at warehouse facilities and lighting arrangements in the hospitality industry which use significant amounts of energy and require tailored strategies to reduce this.

Given the turnover that some SMEs are recording in Ireland it can be difficult to have oversight of all monetary outgoings from a business. Therefore, many business owners simply don't notice the amount of unnecessary energy they are using in the day-to-day running of their business.

For this reason, an important theme throughout all these reports is the importance of engaging employee's regarding good energy management. Educating all building users on the simple ways in which everyone within the building can contribute towards saving energy. Simple measures, such as installing lights with motion sensors, or switching off IT equipment not in use rather than leaving them on standby, have proven to be successful in saving energy.

Figure 28 – The spread of commercial businesses in the Trim SEC

Method

An analysis of commercial/business energy consumption within the SEC catchment was carried out using various data sources including CIBSE TM46 Energy Benchmarks, Valuations Office and Energy Consumption and SEAI's 'Extensive Survey of Commercial Building Stock in Ireland'.

In order to estimate the potential energy usage of all Industrial and Commercial premises within the catchment area, a method based on estimated floor area and business category was implemented. Energy benchmarks for various business categories were sourced from "CIBSE TM46 Energy Benchmarks and Energy Consumption Guide" and were applied to the floor area data available.

As part of the energy master plan for Trim seven non-domestic premises were audited to Ashrae level 1 to identify any opportunities within these premises for energy efficiency measures. The recommendations within the reports are based on utility data, a site audit, and related engineering calculations.

The site audit consisted of a walk-through of the facility and review of the electrical and mechanical systems and equipment. It is recommended that the organizations implement the measures identified in their reports to contribute towards the energy consumption reduction goals as set out in the Climate Action Plan.

The premises which were audited are listed below and a detailed report was provided to each of the property owners the results of which are located within the Appendices:

- Halpin House
- Lynches' Convenience Store
- St Patrick's National School & Diocesan Hall
- Trim GAA
- Trim Tennis Club
- The Steeple Buildings
- The Stile Convenience Store

Results and Analysis

Below is an overview of the estimated total energy usage, emissions and spend from the Commercial/Business sector within the Trim SEC. This helps the SEC get an idea of just how much their commercial sector needs to reduce its energy usage by in order to keep in line with the Irish Government's targets in the Climate Action Plan.

Table 17 - SEC Non-Domestic Energy, CO_2 and Spend

Electricity typical benchmark (MW·h)	Fossil-thermal typical benchmark (MW·h)	Illustrative electricity typical benchmark (tCO2)	Illustrative fossil-thermal typical benchmark (tCO2)	Illustrative total typical benchmark (tCO2)	Illustrative total Energy Spend (€)
11913	15064	6556	2863	9419	€14,249,949

Support for SMEs

Aside from the recommendations contained within the EMP and supplementary non-domestic audits, businesses can utilize the recently created ClimateToolKit [13] website launched by the government to help businesses get started in taking climate action.

This online tool allows SMEs to input some simple information and get an estimate of their carbon footprint and a personalised action plan to reduce it. Each tailored action plan includes straight-forward, practical instructions and highlights the relevant help that is available from Government, through agencies such as Enterprise Ireland, the Local Enterprise Offices and SEAI.

SEAI have also launched a free, online, learning platform called the 'SEAI Energy Academy' which is designed to help businesses increase their energy efficiency and reduce their energy related costs. It delivers short, interactive, animated modules on a wide array of topic areas including business and office energy efficiency.

Furthermore, SEAI are currently running an energy audit scheme that offers SMEs a €2,000 voucher towards the cost of a high-quality energy audit[14]. These energy audits are suitable for businesses with an annual energy spend of over €10,000. These energy audits delve deeper than those contained within the report, analysing the sites suitability for various renewable technologies, the most significant users of energy in their business and their overall carbon footprint.

A highly detailed audit like this gives business owners the confidence to take appropriate steps to improve both their energy efficiency and reduce their annual energy bills.

The non-domestic audits identified several opportunities within the premises which can be developed into energy efficiency projects. The projects are detailed within the Register of Opportunities document which accompanies this report and the full reports are included in the Appendices. The key standout projects are detailed below:

- **The Steeples Building**
  - Install attic insulation (300mm thick) and cavity wall insulation as well as fitting all radiators with thermostatic valves
- **Halpin House**
  - Upgrade the existing non-condensing gas boilers to a new 24kW condensing model
- **Trim GAA**
  - Upgrade all lighting across the complex to LED fittings
- **Lynches' Convenience store/The Stiles**
  - Implement refrigeration set points in in order to ensure the refrigerators are not using more energy to cool than is necessary

[13] climatetoolkit4business.gov.ie

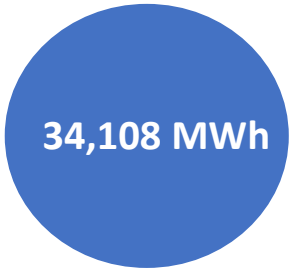
[14] https://www.seai.ie/business-and-public-sector/small-and-medium-business/supports/energy-audits/

Renewable Energy

The Irish Government has a target of producing 80% of the country's electricity from renewables by 2030. Where a 20% reduction in electricity consumption could be achieved in the Trim SEC by energy efficiency measures, there would remain a residual demand of 34,108 MWh. In order to offset this residual demand a 15 MW wind turbine or a 39 MW solar farm would be required to service the catchment area.

A community led Renewable Electricity Support Scheme (RESS) project which has an upper limit of 5MW would be capable of providing a significant amount of the residual energy demand for the community.

Residual Energy Demand



A detailed set of calculations on the generator size and the arrangements to use the energy locally would need to be carried out under a more detailed scoping study.

Initial calculations indicate that that a wind turbine or solar photovoltaic farm correctly sized and installed with the capacity described above could generate sufficient electricity to meet this demand. A battery or other storage solution may also form part of such an initiative.

Renewable Electricity Support Scheme

The Government of Ireland has put in place a scheme called the Renewable Electricity Support Scheme (RESS) which aims to deliver increased community involvement in renewable energy projects. This scheme provides financial support for renewable electricity projects of over 0.5 MW in size in the Republic of Ireland.

RESS is an auction-based scheme, which invites renewable electricity projects to bid for capacity and receive a guaranteed price for the electricity they generate.

Support schemes like RESS, in place all over the world, are a way of ensuring that renewable energy technologies are incentivized to replace the use of fossil fuels in our economy. Communities are incentivized to invest in renewable technologies by Governments who contract to buy electricity at a guaranteed price for the long term, typically a period of about fifteen years.

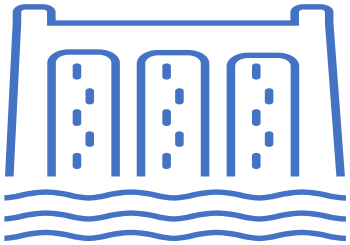
In total, about 3,000 'gigawatt-hours' will be put up for auction by the state. The most cost-efficient bidder will be the first picked, the second most cost-efficient will be the second picked and so on until all the gigawatt-hours are accounted for. In essence this means only the most efficient project offering a price at the lowest level will get picked.

Eligible technologies under the RESS scheme include:

Onshore wind turbines/solar thermal/solar PV technology

Onshore wind turbines/solar thermal/solar PV technology with battery storage

High-efficiency Combined Heat and Power (CHP) boilers fueled exclusively by waste, biomass & biogas



Hydroelectric

All projects looking for support under the RESS scheme will need to meet certain criteria before becoming successful. There are two aspects of community participation in RESS:

- Community Led Projects
- Community Benefit Funds

Community Led Project Criteria

The application must be made in conjunction with a Sustainable Energy Community (SEC). The SEC must be identified in the Declaration of a Community-Led Project, together with a description of the relationship between the Applicant and the Sustainable Energy Community. In addition:

- Project size must be between 0.5 and 5 Megawatts
- Fully (100%) owned by a Renewable Energy Community (REC)- primary purpose is community benefit (environmental, economic, or social) rather than financial profit
- Community group must be based on open and voluntary participation
- Participation based on local domicile (within close proximity to the RESS project)

Community Benefit Funds

A key feature of RESS is that all projects must establish a 'Community Benefit Fund' to be used for the wider economic, environmental, social and cultural well-being of the local community. The amount payable by RESS Projects into the Community Benefit Fund by the Government is mandated at €2 per Megawatt hour of electricity generated from a RESS Project. This means there are quantifiable funds made available annually for the benefit of the local community.

This will allow communities to further invest in local renewable energy, energy efficiency measures and climate action initiatives. For RESS-1 alone it is envisaged that almost €4m in annual payments, over a period of approximately 15 years, will be paid into the Community Benefit Funds in communities that host RESS-1 projects.

With several more RESS auctions planned in the coming decade the total funds involved are several hundred million euro in value over the lifetime of RESS.

Recently it was announced that Community-led projects seeking to apply to future RESS auctions, must be 100% owned by the community, as opposed to being majority owned as was the case for RESS-1. Therefore, Community-Led Projects must now meet the following requirements:

(a) at all relevant times be 100% owned by a Renewable Energy Community (the "Relevant REC") either by way of (i) a direct ownership of the RESS 2 Project's assets, or (ii) a direct ownership of the shares in the Generator; and

(b) at all relevant times, 100% of all profits, dividends and surpluses derived from the RESS 2 Project are returned to the Relevant REC.

Community collaboration

Opportunities for renewable energy generation within the Trim SEC catchment area are detailed in the Table below. However, project planning, grid infrastructure and community buy-in remain the major obstacles to a community led development.

Community consensus is the key to the successful development of a community owned project. If there is consensus within the community, an application can then be made to LEADER (or a similar funding body) to carry out a feasibility study for a renewable energy development in the areas within the community identified.

This feasibility study should look at grid capacity and constraints, planning constraints, environmental designations, and residential buffer zones around the proposed sites.

The first step in starting the process of developing a community owned project is to identify generation capacity within the existing electrical grid. Once suitable generation capacity has been identified at a suitable substation within the catchment area, the Trim SEC can start looking at suitable sites for wind or solar projects.

SEAI's 'Community Energy Resource Toolkit' [15] has created some very informative documents to help guide SECs who wish to complete a Renewable Energy project in their area from start to finish. The Toolkit provides a set of guidance modules across a number of different areas (including technology options, business planning, project development stages, setting up an organisation / governance strategy) to support development and delivery of a Renewable Energy project.

[15] https://www.seai.ie/community-energy/ress/enabling-framework/

Sustainable Energy Roadmap

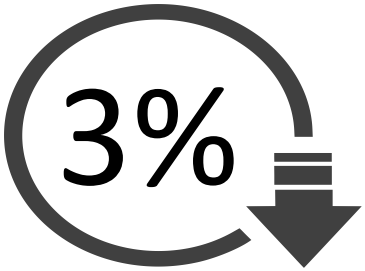
The sustainability Energy Roadmap is one of the key outputs of the Energy Master Plan as it outlines to the community the scale of the challenge faced in moving the community from their baseline to achieving 2030 reduction targets. The following analysis provides a general path for the SEC to reach each of their targets of: significant energy reduction and 30% renewable energy generation by 2030.

These targets have been broken down in each of the sectors detailed in the table below.

Table 18:- 3% Annual reduction in the Carbon Footprint for Trim SEC

Community CO2	
tCO2	**44,162**
% Annual CO2 Reduction	3%
Year	**tCO2**
2022	42,837
2023	41,552
2024	40,305
2025	39,096
2026	37,923
2027	36,785
2028	35,682
2029	34,611
2030	33,573
2031	32,566
2032	31,589

Table 19 - Trim SEC Plan to 2030			
	Number of Projects	Primary Energy Savings (kWh)	CO_2 Savings (tonnes)
Community owned 15MW Wind Project	1	34,108,290	16,467
Residential Housing Upgrades to B1 Medium Heat Pump	500	8,199,000	1,985
Electrical Car Ownership	40% Change	7,562,538	2,227
Reduction in Car Journeys though remote working	40% Change	12,119,703	2,685
Total		61,989,531	23,364



Annual Reduction in the Carbon Footprint for Trim SEC

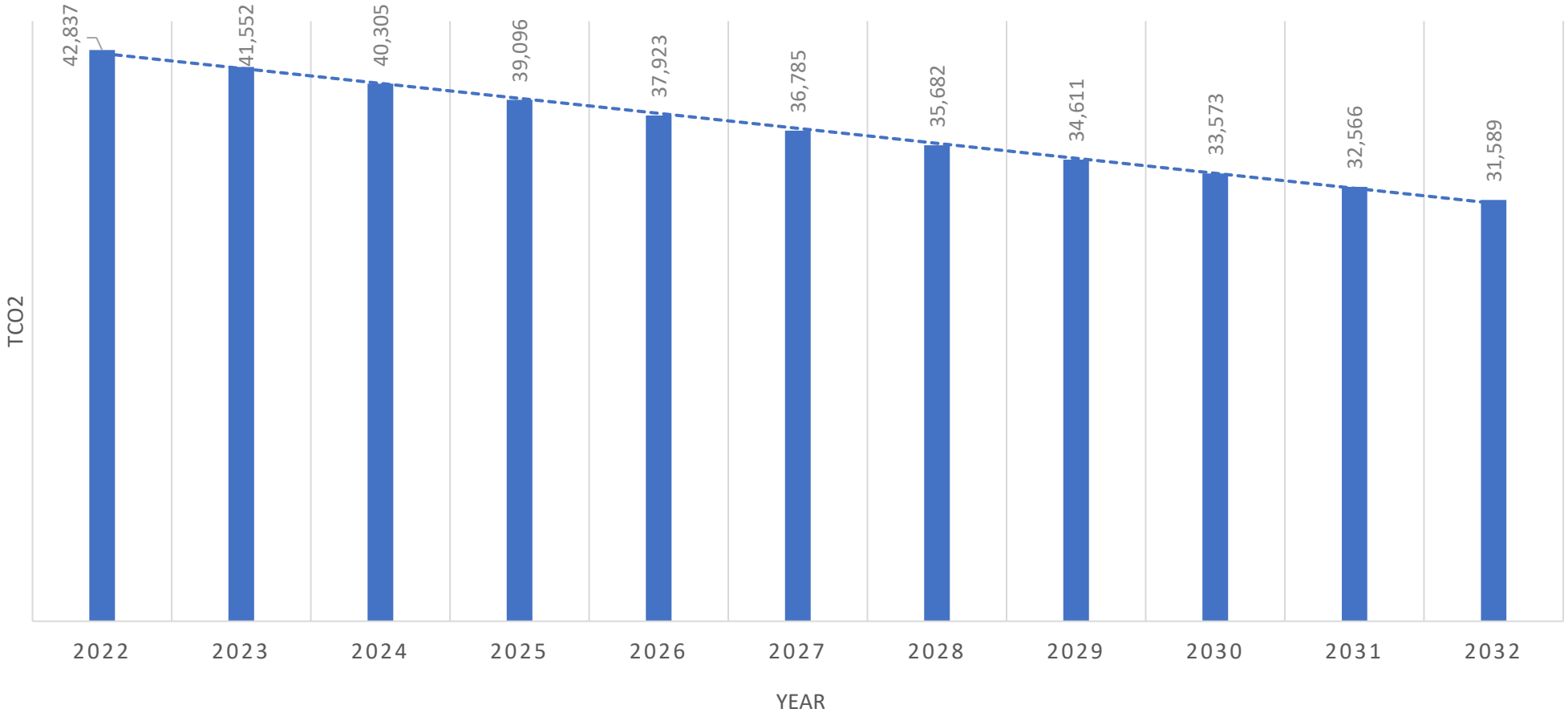


Figure 30 – The reduction in tonnes of CO_2 annually if the SEC reduces its Carbon footprint by 3%

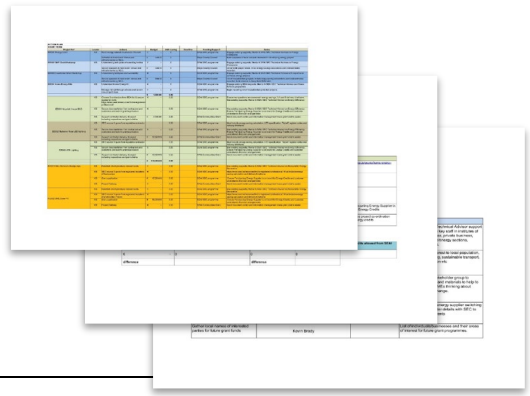
Register of Opportunities (RoO)

The Register of Opportunities (RoO)[16] developed for Trim SEC provides a list of projects in three categories which have been identified within the community.

Behavior and Energy Efficiency and Renewable Energy Projects have been identified, which have both short- and medium-term timescales. The RoO provides for a detailed project specific planning tool including project cost, energy impact and carbon savings.

The Register of Opportunities (RoO) is a live document used to identify, evaluate, and plan your energy projects. The Sustainable Energy Community owns this document and is responsible for using, editing and improving the content in order to match its ambitions.

The RoO is presented in an excel workbook because some parts contain formulas to calculate financial and energy savings.
* Example of Register of Opportunities Document



[16] *Each of the projects are detailed within the RoO spreadsheet, which is a live document attached as Appendix B.*

As part of the scope of works for the Energy Master Plan for Trim SEC, a number of domestic energy audits and non-domestic audits were carried out on buildings selected within the community. Sections of the register of opportunities was generated from these audits based on the information available.

The key criteria when selecting projects where are suitable to progress are:

1) Return on investment or payback period
2) Complexity of the project
3) Are the project costs known?
4) Is supporting funding available?
5) What impact is the project going to have on the community?

Key standout projects are detailed below:

- 6kWp Solar PV system and Air Source Heat Pump at St Patrick's National School and Diocesan Hall
- 6kWp Solar PV system at Trim GAA
- Community EV Charging Point
- Feasibility study for a Renewable Energy Support Scheme (RESS) community power project in the Trim SEC

Note: *The costings provided are indicative only and quotations should be sought from suitably qualified contractors following an appropriate design and specification process.*

Action Plan for Trim SEC

Capacity Building

One of the key elements in the development of a successful Sustainable Energy Community is the ability to build capacity within the group, which is required for the implementation of successful projects. By increasing the capacity of the SEC there is a higher probability that the group will be able to take on more complex projects as their confidence grows. Capacity building can be achieved by utilising the mentors appointed to the group by SEAI to arrange educational and training initiatives as well as vocational and third level education bodies. The SEC can also work with other established SECs to arrange shared learnings

Energy Master Plan Dissemination to Community

The dissemination of the Energy Master Plan throughout the community is one of the key actions for the SEC now that the plan has been completed. The Energy Master Plan will provide the community with an understanding of what their current energy profile is and where they as a community should put their efforts in reducing their energy and carbon footprint.

Communication and Engagement Events

Engagement with other community organisations to identify shared needs especially in the development of existing community assets for remote working may be beneficial to the greater community. The upgrading and reimagining of community buildings through BEC grants to provide remote working hubs, childcare facilities, or social hubs feeds into the DO stage of the SEC's plan. In addition to other community groups, private sector groups such as energy project developers which have community benefit funds may be interested in providing support to the SEC, but only if they are aware of its existence.

Low Lying Fruit First

The SEC is encouraged to develop low-effort, low-cost efficiency projects first to increase their internal capacity and skills. These low-effort, low-cost efficiency measures can be quick wins for the community and encourage the group to tackle more complex, higher effort projects in the future. These projects also provide a focus point for the greater community to prompt discussions and knowledge sharing experiences.

LEAF (Local Energy Action Fund) Funding

Avail of funding streams from SEAI for activation of energy efficiency projects within your community. These funding streams are constantly changing, and the community should continue to engage with SEAI on a regular basis to understand what is available for communities.

Bibliography

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[2] DCENR, "National Energy Efficiency Action Plan," Department of Communications Energy and Natural Resources2014, Available: https://www.dccae.gov.ie/documents/NEEAP 4.pdf.

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[4] SEAI, "Conversion Factors,", Available: https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors/

[5] SEAI, "Public Sector Energy Monitoring & Reporting System," 2017, Available: https://www.seai.ie/energy-in-business/monitoring-and-reporting/FAQs.

[6] CSO, “2011 Census - Agriculture.” Central Statistics Office 2012

[7] NSAI, SR54 Code of Practise for the Energy Efficiency Retrofit of Buildings

Appendix A: Grant Streams

Better Energy Communities

Better Energy Communities is the national retrofit initiative which provides capital grants for energy efficiency projects in Irish communities. The BEC programme with grant support of up to €28 million for 2021 aims to deliver energy savings to homeowners, communities, and private sector organisations. Projects must be community orientated with a focus on cross-sectoral approach.

Successful Community projects must demonstrate some or all of the following characteristics.

- Community benefits
- Multiple elements, not a single focus
- Mix of sustainable solutions
- Innovation and project ambition
- Justified energy savings
- An ability to deliver the project

The following list outlines the types of measures that SEAI want to support through the Communities grant program

- Building Fabric Upgrades
- Technology and System upgrades
- Integration of renewable energy sources
- Domestic Combined Fabric Upgrade
- Single Building Demonstration projects will be considered under the Communities Grant

BEC 2021 Funding Levels

Residential		
Home type	Fuel type	Funding Level
Private	Fuel Poor	Up to 80%
Private	Non-Fuel Poor	Up to 35%
Local Authority		Up to 35%
Private Rented Homes		Up to 35%
Housing Association		Up to 50%

Non-Residential	
Type	Funding Level
Not for profit/community	30% Up to 50% (may be available subject to state aid rules and SEAI approval in advance)
Private and public sector	Up to 30%
Public Sector	> 30% ≤ 50%

SEAI's Home Energy Grants

https://www.seai.ie/grants/home-energy-grants/

SEAI primarily has three grants and supports schemes for individual homeowners who wish to make energy upgrades to their home:

- Free Energy Upgrade
- Individual Energy Upgrade Grants
- One Stop Shop Service

Free Energy Upgrade

This SEAI grant provides free energy-efficient home upgrades for homeowners that receive certain welfare payments. Homeowners will receive a free assessment from an SEAI surveyor who will recommend the most suitable upgrades for the property.

Eligible Free Energy Upgrade home improvements		
Attic insulation	Cavity wall insulation	External wall insulation
Internal wall insulation	Replacement windows	Heating Systems upgrade
Heating controls	Ventilation	Compact fluorescent lamps (CFLs)
Draught proofing	Lagging jacket	

To qualify for any of these SEAI grants under the Free Energy Upgrade Scheme, homeowners need to meet all of the following criteria:

- The home must be your main residence and you must be the homeowner
- The home was constructed before 1993. It must have also been lived in prior to this date
- The home has an energy rating of C, D, E, F, or G.
- You receive one of the following government payments:
  - Fuel Allowance scheme
  - Working Family Payment
  - One-Parent Family Payment
  - Domiciliary Care Allowance
  - Carers Allowance. You must be living with the person you are caring for
  - Disability Allowance for more than six months. You must also have a child less than seven years old
  - Job Seekers Allowance for more than six months. You must also have a child less than seven years old

The Free Energy Upgrade grant will cover all expenses for a Home Survey, Contractor Selection, Contractor Works and a BER certificate. It is important to note that it will be the Surveyor who decides the improvements to make, the homeowner cannot choose which specific upgrades they would like.

Individual Energy Upgrade Grants

This grant allows the homeowner to choose which home improvements to bring, choose the registered contractor, and complete the work yourself. Despite being more in charge of this grant, you still need to wait for the approval of the grant before starting the project.

	Individual Energy Upgrade Grants			
Measure	**Detached**	**Semi D/End of Terrace**	**Mid Terrace**	**Apartment**
Ceiling insulation	€1,500	€1,300	€1,200	€800
Cavity Wall Insulation	€1,700	€1,200	€800	€400
External Wall Insulation	€8,000	€6,000	€3,500	€3,000
Internal Insulation	€4,500	€3,500	€2,000	€1,500
Air to Air Heat pump system	€3,500			
Air to water Heat pump system	€6,000			€4,500
Ground source to water Heat pump system	€6,000			€4,500
Heat Pump Technical Assessment	€200			
Heating Controls (Homes built pre-2011)	€700			
Solar Water heating	€1,200			
Solar PV (Homes built pre-2021)	€1,800 for 2kWp system, additional €300 per kWp up to €2,400			

To qualify for any of the SEAI individual energy upgrade grants, you need to meet all four of the following criteria:

- The home must be your main residence and you must be the homeowner
- For any of the insulation and heating controls grants, your home must have been constructed and lived in before 2011
- For any of the heat pumps and renewable energy systems grants, your home must have been constructed and lived in before 2021
- Your home must not have received the same home improvement government grant in the past

One Stop Shop Service

Under this programme, homeowners will be able to receive a complete home energy upgrade. These will be managed by registered contractors who will manage the entire process for you. From the initial assessment, placing the SEAI grant application for you, conducting the work, and providing the final BER.

	One Stop Shop Service grants			
Measure	**Detached**	**Semi D/End of Terrace**	**Mid Terrace**	**Apartment**
Home Energy Assessment	€ 350			
Air Tightness	€ 1,000			
Mechanical Ventilation	€ 1,500			
Solar Hot Water	€ 1,200			
Bonus for reaching B2 with a Heat Pump	€ 2,000			
Heating Controls	€ 700			
Air to Air Heat Pump system	€ 3,500			
Floor insulation	€ 3,500			
External doors (max of 2)	€800 per door			
Heat Pump Systems	€6,500			€4,500
Central Heating System for Heat Pump	€2,000			€1,000

	One Stop Shop Service grants			
Measure	**Detached**	**Semi D/End of Terrace**	**Mid Terrace**	**Apartment**
Ceiling insulation	€3,000	€3,000	€2,000	€1,500
Cavity Wall Insulation	€4,000	€3,000	€1,800	€1,500
External Wall Insulation	€2,000	€1,600	€1,200	€800
Internal Insulation	€4,500	€3,500	€2,000	€1,500
Rafter Insulation	€3,000	€3,000	€2,000	€1,500
Windows (Complete Upgrade)	€4,000	€3,000	€1,800	€1,500
Project Management	€2,000	€1,600	€1,200	€800
Solar PV - 0 to 2kWp	€900/kWp			
Solar PV - 2 to 4kWp	€300/kWp			

Your home or property needs to meet all of the following criteria to qualify for the One Stop Shop Service grant:

- The home must be your main residence and you must be the homeowner
- Your home must have been constructed and lived in before 2011 for insulation and heating controls grants
- Your home must have been constructed and lived in before 2021 for heat pumps and renewable energy systems grants
- Your property must have a B3 or lower energy efficiency rating and a minimum of a B2 upon completion of the upgrades
- Your property must not have received government grants in the past for the same home improvement

Electric Vehicles

Privately bought EVs

A maximum grant of €5,000 is available for qualifying new electric vehicles when purchased privately. Approved EVs with a List Price of less than €14,000 will not receive a grant. As of the 1st of July 2021, there is a cap of €60,000 on the full price of all vehicles. The full price of the vehicle to the customer includes all optional extras, paint, and delivery for excludes any incentives such as grants or rebates.

List Price of Approved EV	Grant available
€14,000 to €15,000	€2,000
€15,000 to €16,000	€2,500
€16,000 to €17,000	€3,000
€17,000 to €18,000	€3,500
€18,000 to €19,000	€4,000
€19,000 to €20,000	€4,500
Greater than €20,000	€5,000

Commercially bought EVs

SEAI provides grant supports towards the purchase of new N1 category electric vehicles for business and public entities. N1 category vehicles are typically small goods carrying vans with a technically permissible maximum mass not exceeding 3500kg.
A maximum grant of €3,800 is available for qualifying N1 category EVs when purchased commercially. Approved EVs with a list price of less than €14,000 will not receive a grant. It should be noted that these grants apply to new vehicles only and cannot be claimed on secondhand vehicles.

The grant level depends on the list price of the vehicle. This is the full non-discounted price in the absence of VRT relief or grant support.

Vehicle Registration Tax

Electrical vehicles receive VRT relief separately to SEAI grant support as well as reduced motor tax.

Home Unit Charger

SEAI provide a grant up to the value of €600 towards the purchase and installation of a home charger unit.

Benefit in Kind

For commercial electric cars, Revenue provides an exemption for Benefit in Kind.[17]

[17] https://www.seai.ie/sustainable-solutions/electric-vehicles/