

Energy Master Plan

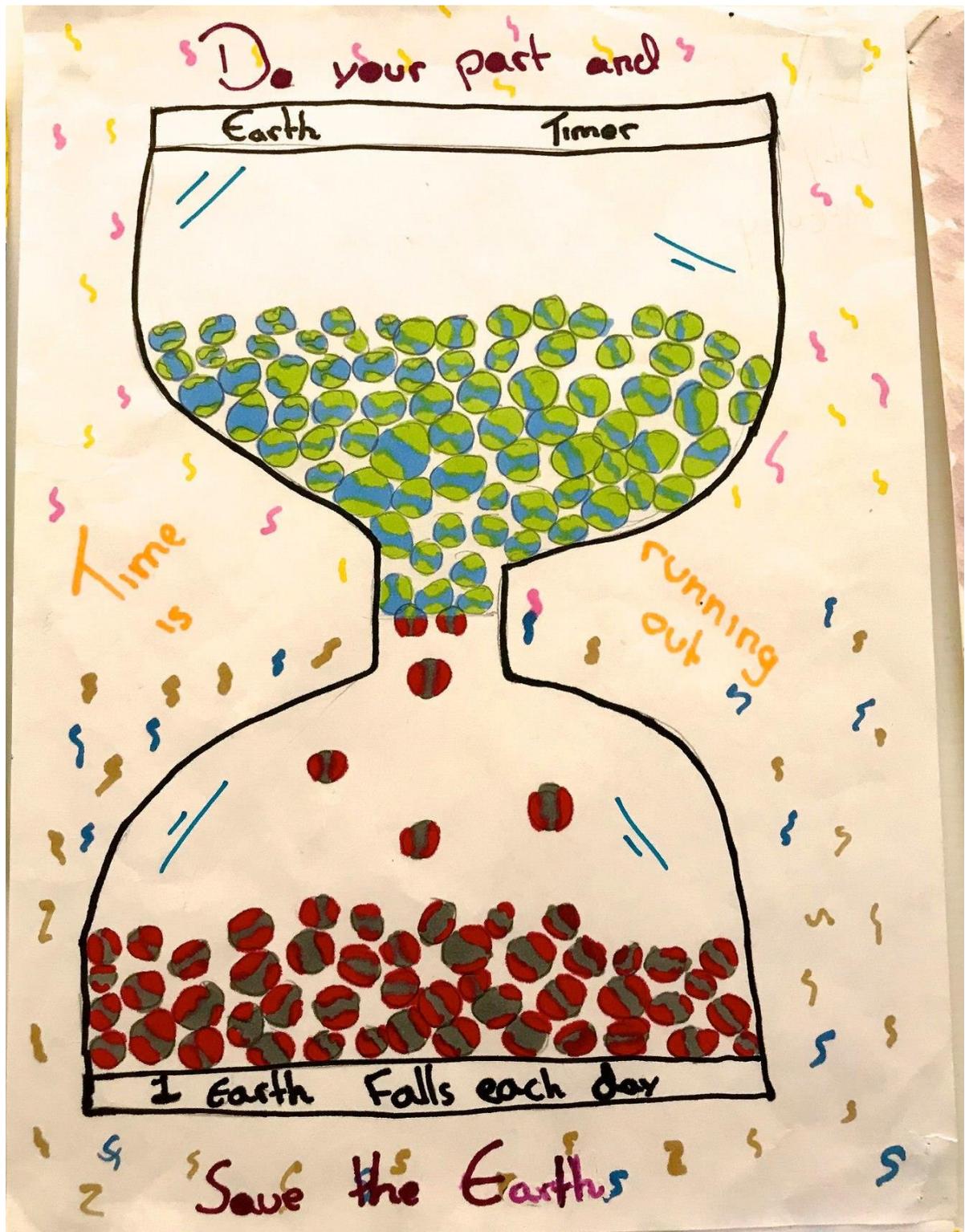


Dalkey

**Energy Master Plan
and
Register of Opportunities**

Dalkey Sustainable Energy Community (SEC)

31st March 2021



Dalkey Sustainable Energy Community Save Energy at Home Children's Art Competition Winning Entry

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Appendix 7 – Climate Action Plan

1 Summary

Dalkey Sustainable Energy Community (SEC)

Dalkey SEC was initiated and is led by Dalkey Tidy Towns. The objective is to contribute to Ireland meeting its national carbon emission reduction targets by promoting recognition of climate change issues; raising awareness of how we are all part of the solution and to encourage involvement in behavioural changes and actions that can reduce our local carbon footprint.

Current Dalkey SEC Baseline Data

Total Energy Consumption 74,283,790 kWh/yr	Estimated Cost €8,052,549	3,025 Total Dwellings¹ (2,603 Occupied)
Commercial Total Energy 11,225,475 kWh/yr	Average BER 299.7 kWh/m ² /yr (D2)	Residential Total Energy 63,058,315 kWh/yr (84%)

Based on 2016 Census and SEAI Data

Residential Retrofit Measures

The following tables summarise the recommended residential retrofit measures based on domestic surveys carried out at 10 selected households in Dalkey SEC as well as a summary of the average costs and benefits.

	Starter Package²	Standard Package	Advanced Package
Low Energy Lights	Yes	Yes	Yes
Roof/Attic Insulation	Yes	Yes	Yes
Heating Controls	Yes	Yes	No
Wall Insulation	No	Yes	Yes
Condensing Boiler	No	Yes (if applicable)	No
Wood Stove	No	No	Yes (if applicable)
Windows	No	No	Yes
Floor Insulation	No	No	Yes (if applicable)
Doors	No	No	Yes
A/W Heat Pump	No	No	Yes
Photovoltaics	No	No	Yes (if applicable)

¹ Including occupied and unoccupied.

² For SEAI Community grant the minimum post works is B2 which will define a minimum package and will exclude the starter package from the Communities grant for most homes. Building Regulations also require a minimum B2 rating if over 25% of the fabric is being altered (eg wall insulation). Individual measures can still be funded through the Better Energy Homes scheme.

Average Costs and Savings for Retrofit Packages				
	Average Cost	Cost After Grant	Average Saving/yr	Payback Years
Starter	€4,040	€3,720	€424	8.8
Standard	€20,653	€13,727	€1,844	7.4
Advanced	€46,574	€30,588	€3,177	9.6

Commercial & Public

Energy audits were carried out at three non-domestic sites: Harold Boys' National School, Dalkey Pharmacy and Cuala GAA Club³. These include typical energy uses in the commercial and public sector, that is primarily lighting and space heating. None of the sites audited had a significant refrigeration or cooling load which would be typical in, for example, the retail and hospitality sector.

Projects Identified		
Starter	Standard	Advanced
LED Lighting Heating Controls Energy Management	Air to Air Heat Pump	Solar PV

Energy Management Plan

Dalkey SEC has been very successful in promoting engagement with the local community. A highly successful event with almost 500 attendees was held in March 2020 and in January 2021 a survey was completed where 100 local householders responded and over 40 expressed an interest in progressing energy-saving projects in their homes. Dalkey SEC plans to build on this success through, *inter alia*, the following measures:

- Engagement with householders and businesses
- Awareness-raising activities within the community (Community newsletter articles, social media promotions, events and surveys)
- Promoting the inclusion of energy efficiency in refurbishment/extension projects
- Promotion of grant schemes (e.g. Better Energy Homes (BEH) & Communities Grant)
- Promoting interest in projects for Communities Grant application
- Monitoring and reporting on progress
- Publicising success stories
- 'Switch & Save' initiative for both residential and commercial sectors
- Residential Energy Usage and Behavioural Survey

³ An energy audit was also started in Finnegan's pub but was not completed due to COVID restrictions.

2 Introduction

Energy Solutions was appointed to develop a comprehensive Energy Master Plan (EMP) as well as generating an associated Register of Opportunities (RoO) for Dalkey Sustainable Energy Community.

The EMP and RoO includes:

- A baseline analysis of energy consumption and uses in Dalkey and factors affecting consumption; e.g. age of houses.
- Energy Audits of commercial and domestic buildings.
- A plan to improve efficiency and reduce CO₂ emissions.
- Opportunities to introduce renewable energy technologies for homes and small businesses.
- A Register of Opportunities.

3 Baseline Energy Balance

3.1 Overview of Dalkey SEC

The boundary of Dalkey SEC is defined by the boundary of 25 small areas (as defined by the CSO for the purposes of the census) as shown in Figure 1.

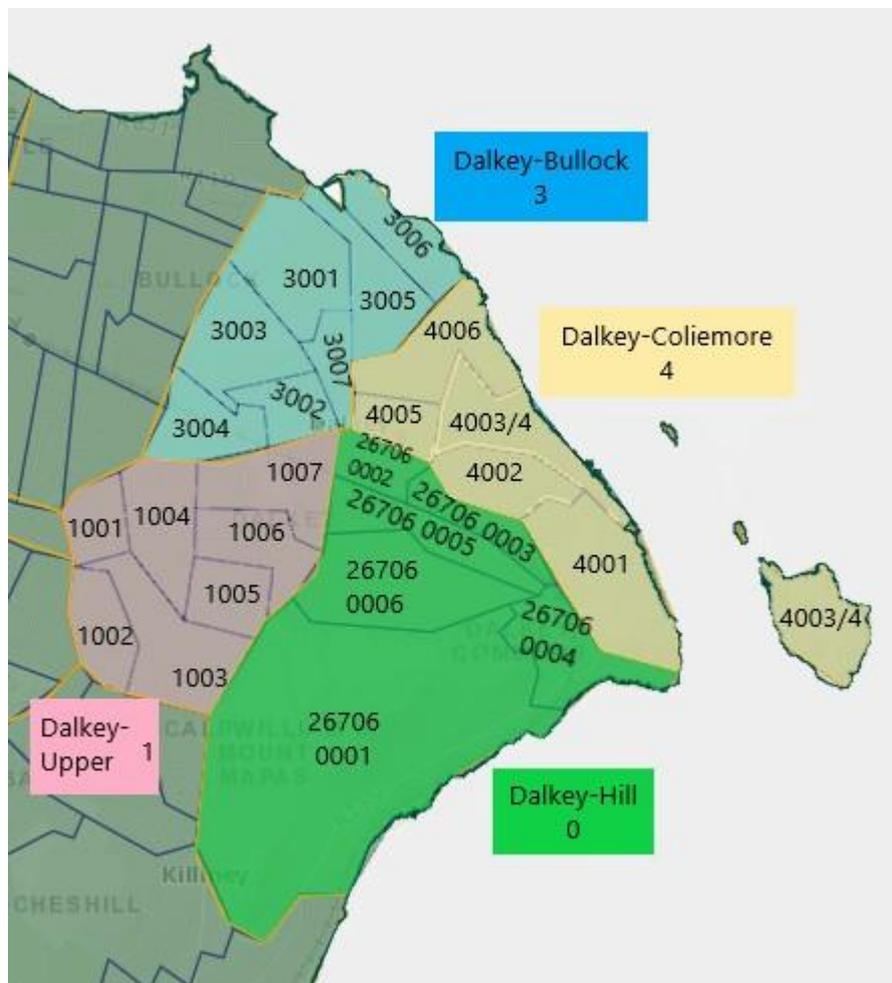


Figure 1 - Map of Dalkey SEC

3.2 Dalkey SEC Energy Demand Analysis

The 2016 census data provides much information relevant to energy consumption and energy efficiency including age of dwellings, heating fuel type, house ownership and car ownership. The SEC area has a total of 3,025 households, 422 of these households were unoccupied during the census according to the CSO, for the purpose of graphs in Sections 4 and 5 only the 2,603 occupied households are used.

3.3 Energy Consumption in Dwellings

SEAI has published the BER database by small area and BERs have been carried out and registered for 1,384 houses in the SEC area or 45% of the total housing stock (3,025). This is a reasonable sample of the housing stock and the data may be considered reasonably representative.

The BER database published by SEAI is used in this analysis for the calculation of energy consumption. The BER is based on a Dwelling Energy Assessment Procedure (DEAP) model

which calculates normal use of energy for space heating, hot water, ventilation and lighting per square metre of the area of a residential unit. The final energy rating given to a household is in kWh/m²/year of primary energy and an energy efficiency scale from A (<25) to G. (>450)

The BER does not account for electricity used for domestic appliances which is the largest consumer of electricity. The electricity baseline demand of the SEC is therefore based on the national average household electricity consumption.

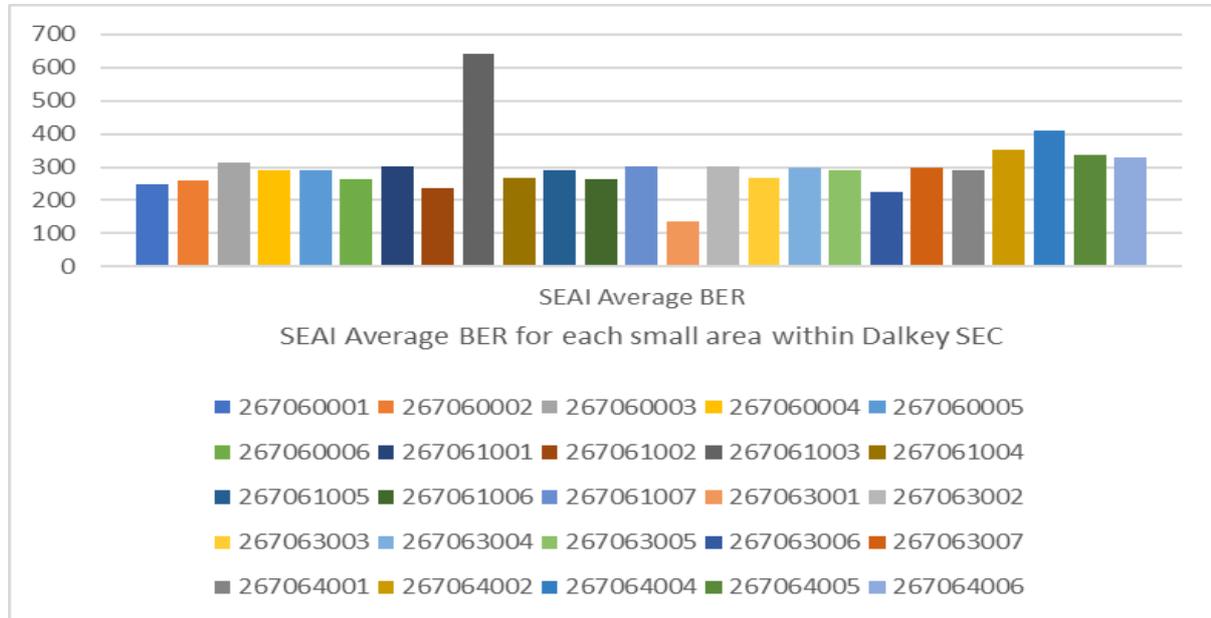


Figure 2 – Distribution of BERs by small area in Dalkey SEC (SEAI Data)

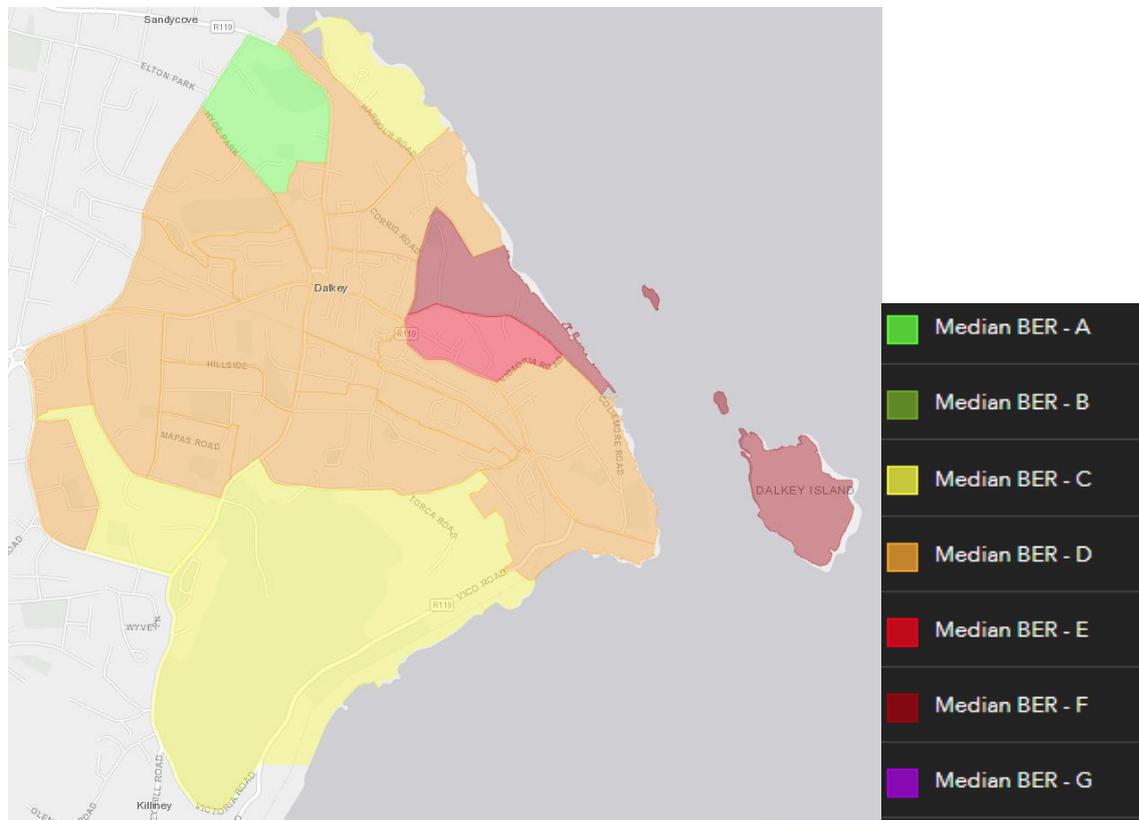


Figure 3 – Map of BERS in Dalkey SEC

The data from SEAI shows that the average BER across the entire area is 300 kWh/m²/yr or a BER of D2. This reflects the older age profile of housing in the area and shows significant potential for improvement in energy performance of dwellings. The primary factor, other than floor area, influencing energy consumption in houses is the year of construction. Figure 5 (on page 9) shows the distribution of the year of construction according to the CSO census data.

Residential Total Energy Use kWh/yr:	63,058,315
Residential Total Electricity Demand kWh/yr:	15,789,260
Residential Total Fossil Fuel Use kWh/yr:	47,269,055
Residential Estimated Total Annual Cost:	€7,047,869
Commercial Total Energy Use kWh/yr:	11,225,475
Commercial Total Electricity Demand kWh/yr:	4,209,553
Commercial Total Fossil Fuel Use kWh/yr:	7,015,922
Commercial Estimated Total Annual Cost:	€1,004,680
Total Energy Use kWh/yr:	74,283,790
Estimated Total Annual Cost:	€8,052,549

Table 1 – Dalkey SEC Baseline Energy Consumption (commercial sector is based on SEAI data)

The energy demand is stated in delivered energy which would be equivalent to metered energy consumption at a premises. Energy consumption in BERs is stated as primary energy which is the energy supply at a system level required to deliver that quantity of energy to the final consumer. A primary energy factor of 1.89 is applied for electricity and 1.1 for gas and other household fuels. The total residential energy uses stated in primary energy is 81,837,662.

Figure 4 shows the small areas with high commercial energy demand (267061003 and 267064005) which contribute significantly to the overall commercial energy demand of Dalkey SEC.

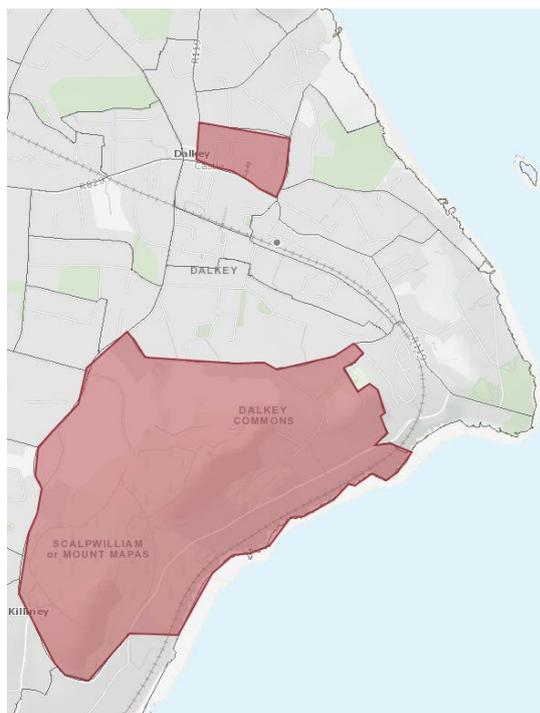


Figure 4- Small areas with high heat demand

SEAI’s Energy in the Residential Sector 2019 report⁴ details the efficiency and consumption patterns across the residential sector in Ireland. The national average ‘non-electrical energy’ (fossil fuel) consumption is 13,885 kWh/year and the average electricity consumption was 4,638 kWh/year per dwelling.

	Total	Dalkey SEC	SEAI
Residential Total Energy Use kWh/yr	63,058,315	20,846	18,523
Residential Electricity Consumption kWh/yr	15,789,260	5,220	4,638
Residential Fossil Fuel Use kWh/yr	47,269,055	15,626	13,885
Annual Energy Cost	€6,498,403	€2,148	€1,909

Table 2 – Dalkey SEC Energy Consumption compared to national average

In Dalkey SEC the fossil fuel consumption is estimated at 15,626 kWh/dwelling/year, this is 12.5% higher than the SEAI national average of fossil fuel consumption. Very few households in the SEC are heated by electricity, with a total of 248 dwellings using electricity for their main source of heating. Nevertheless, average electricity consumption, at 5,220 kWh/yr was also 12.5% above the national average.

The consumption per household in Dalkey SEC is estimated by adjusting the national average household energy consumption according to differences between BER data in Dalkey SEC vs national averages.

⁴ Energy in the Residential Sector, <https://www.seai.ie/resources/publications/Energy-in-the-Residential-Sector-2018-Final.pdf>

4 Characteriation of the Domestic Sector

4.1 Age Profile of Dwellings

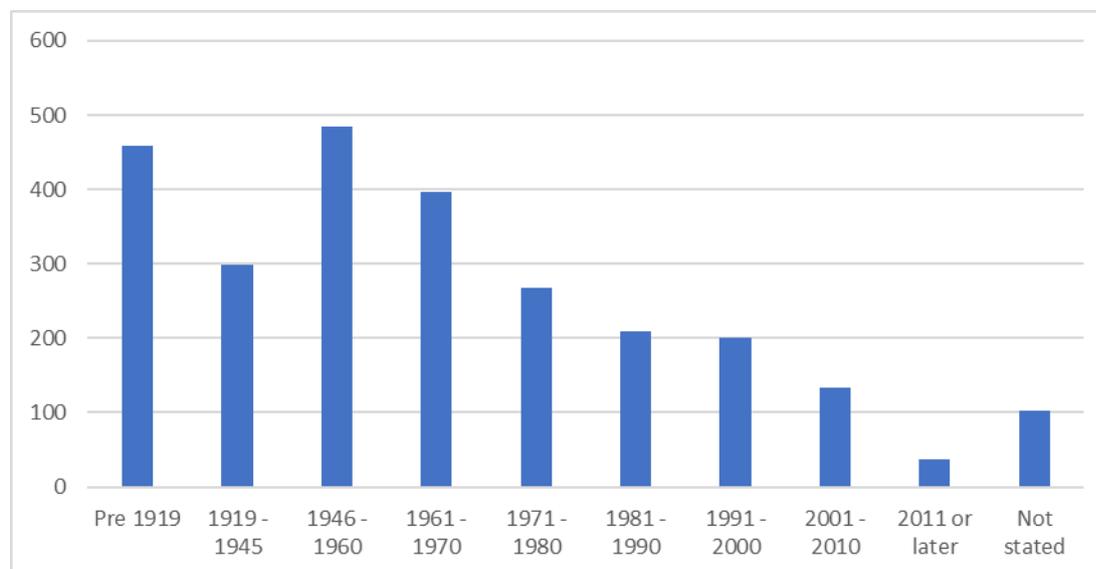


Figure 5- Summary of Age Profile of Dwellings

The age profile of domestic dwellings is shown in Figure 5. 29% of the 2,603 dwellings were constructed pre-1946 with the bulk built between 1946 and 1990, while 12.9% were built between 1991 and 2010. This indicates that there should be widespread opportunities for retrofitting.

4.2 Dwelling Type and Ownership

Figure 6 shows the distribution of dwelling ownership with the majority being owner occupied. 75.8% of residents own their home in Dalkey, 14.8% of households are rented from a private landlord while 4.5% of households are rented from the Local Authority.

The ownership profile has a bearing on the potential for energy efficient retrofits, especially in the private rented sector where there is little incentive for a property owner to invest in energy efficiency while the benefit of reduced energy costs and increased comfort is accrued to the tenant. This effectively rules out the privately rented dwellings as candidates for energy efficient retrofits. A Local Authority is more likely to invest in energy efficiency than a private landlord.

85% of dwellings are houses/bungalows and 14% of dwellings are apartments/flats. This may have impacts on the scope for energy efficient retrofits considering the practicality of certain measures (e.g. fabric upgrades, solar PV, heat pumps) in apartments and flats and other packages of measures need to be considered.

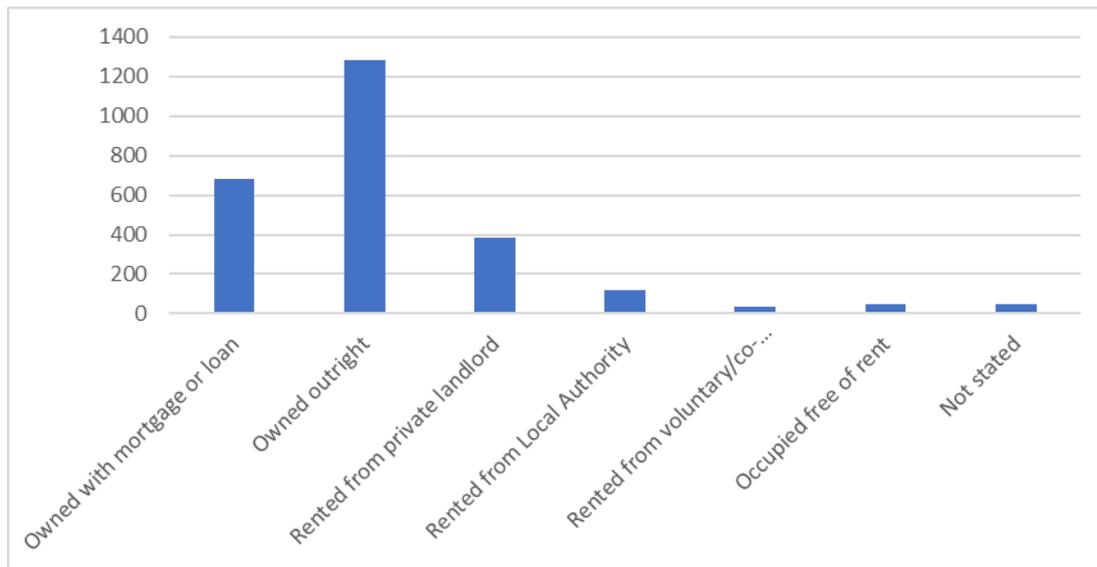


Figure 6- Summary of Dwelling Ownership

4.3 Heating and Hot Water

The predominant means of heating is natural gas (Figure 7) accounting for 74.5 % of the heating. Only 0.8% of households are heated electrically supplemented by solid fuels (coal, peat and wood) and 10.7% of households use oil as their primary source of heating. The main electricity use in the SEC is therefore for lighting and appliances with some consumption for domestic hot water supply.

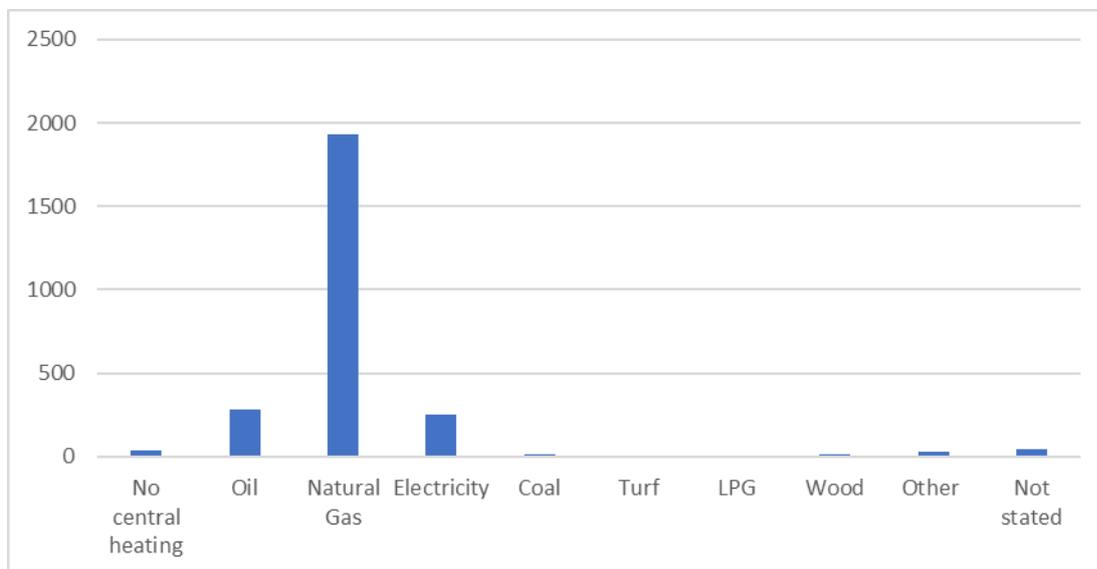


Figure 7- Distribution of heating Type

5 Transport

The transport sector is where we, as a nation, consume the most fossil fuels and where we emit the most CO₂. It is also the largest source of final energy demand in Ireland. In spite of this there has been no meaningful reduction in this consumption in the last 30 years according to energy balance reports from the SEAI. Private cars are the transport mode with the largest energy use. They accounted for 40% of transport final energy demand in 2018. On the other hand, public and private bus or coach transport accounted for less than 3% of transport energy use in 2018 and rail accounting for less than 1%. The balance is largely accounted for by HGV, LGV and aviation.

The average CO₂ emissions per kilometre per car in Ireland is 112 g CO₂/km. In comparison, a passenger on the DART only contributes to 11 g CO₂/km and a passenger on an intercity bus, 15 g CO₂/km. It is difficult to estimate transport emissions in Dalkey but the consumption figures would be expected to be similar to those mentioned above.

Renewable transport fuels have grown from a low base to over 3% of transport final energy use in 2018. This is almost all from biofuels blended with petrol and diesel. Electricity remained at just 0.1% of transport final energy demand in 2018. Most of this was from Luas and DART, but electric vehicles are growing strongly from a low base.

Clearly the biggest challenge and opportunity is to achieve a modal shift from passenger cars for many journeys and to reduce the environmental impact of passenger cars where they are used. Dalkey SEC plans to promote these changes through our activities. Recognising that most households will want to retain the convenience of private car ownership, the main option will be to assist adoption of electric vehicles.

Year	Electric	Plug in Hybrid
2015	497	123
2016	411	286
2017	664	261
2018	1328	727
2019	3803	1349
2020 (to end of Aug)	2749	1977

EV registrations by (CSO figures)

There are many environmental benefits to owning a fully electric vehicle (EV). There are no tailpipe emissions from an electric car, thus it produces less than half the CO₂ per km compared to a diesel or petrol car. In terms of cost, EV's have the lowest rate of motor tax per annum at €120 and can have a 74% reduction in transport costs compared to a comparable new diesel engine car. While electric car ownership has increased considerably in the last five years (Table above), there are however, perceived and some real barriers to EV adoption. These include cost, range limitation and limited charging infrastructure. In addition, many houses and apartments don't have a private driveway which currently precludes the installation of household EV chargers connected to the owner's private electricity supply. Dalkey SEC plans to raise community awareness of developments in EVs and their charging which make them a far more attractive ownership proposition. It is also planned to seek improvement of the local public charging infrastructure and to seek out and promote private charging solutions for apartment residences and homes that front directly on to streets.

Of course there are plenty of other options to reduce energy usage from travel and the best option is to minimise passenger car use. The number of cycling lanes in Dublin are growing as well as the number of public bikes. Public transport can also have a major impact in reducing the carbon footprint of Dalkey residents. Dalkey SEC also plans to promote such alternatives where practical (see below).

5.1 Car Ownership

Figure 8 displays the car ownership of each household. 12.4% of households have no car, 43.6% of households have one car, 34.3% have two cars, 5.7% have three cars and 1.8% of households have four or more cars. Figures 9 and 10 displays the means of travelling to work, school or college. The town of Dalkey has relatively good public transport including the DART and bus routes. The use of Train, DART and Luas services was the second most popular method of travelling to work according to the 2016 census.

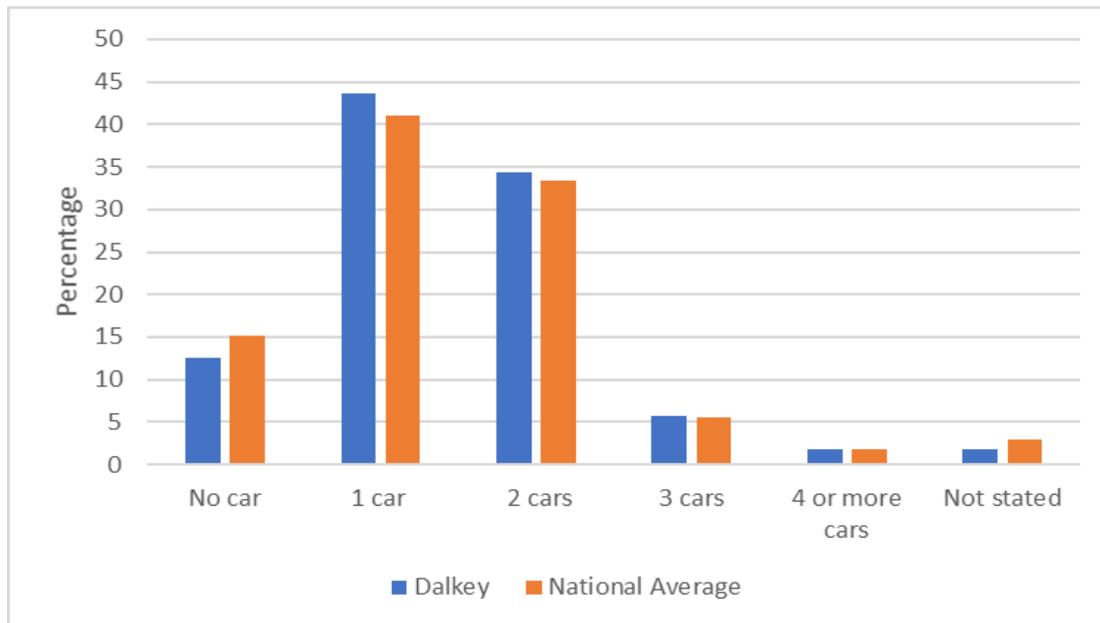


Figure 8- Car Ownership

5.2 Means of Travelling to work, school or college

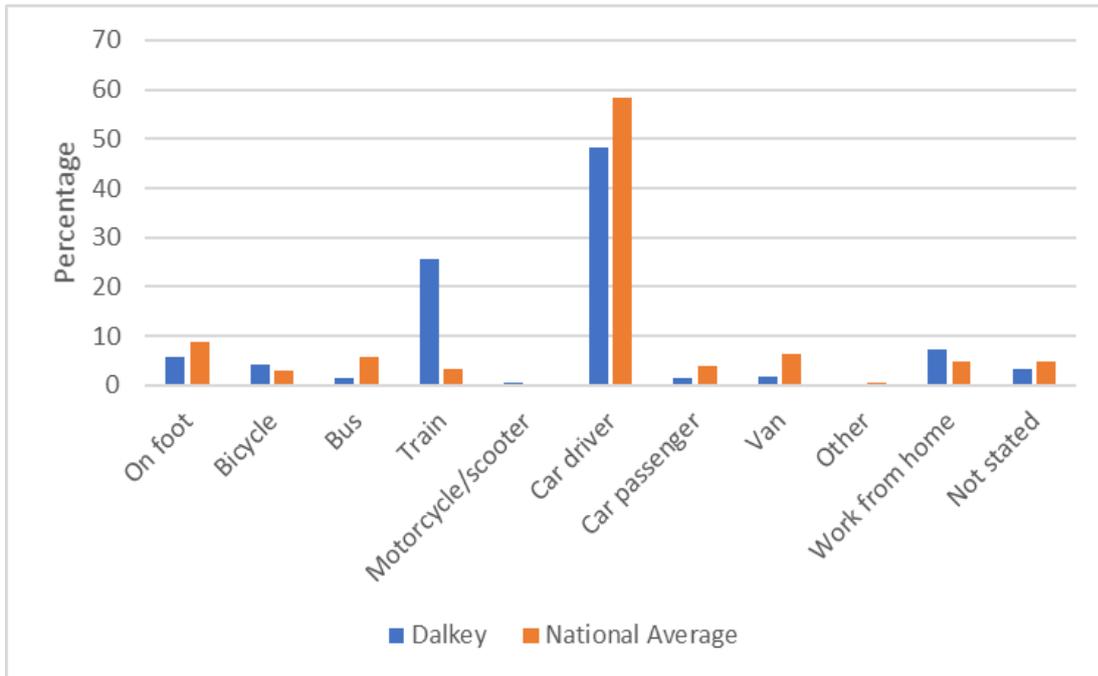


Figure 9- Means of travelling to work

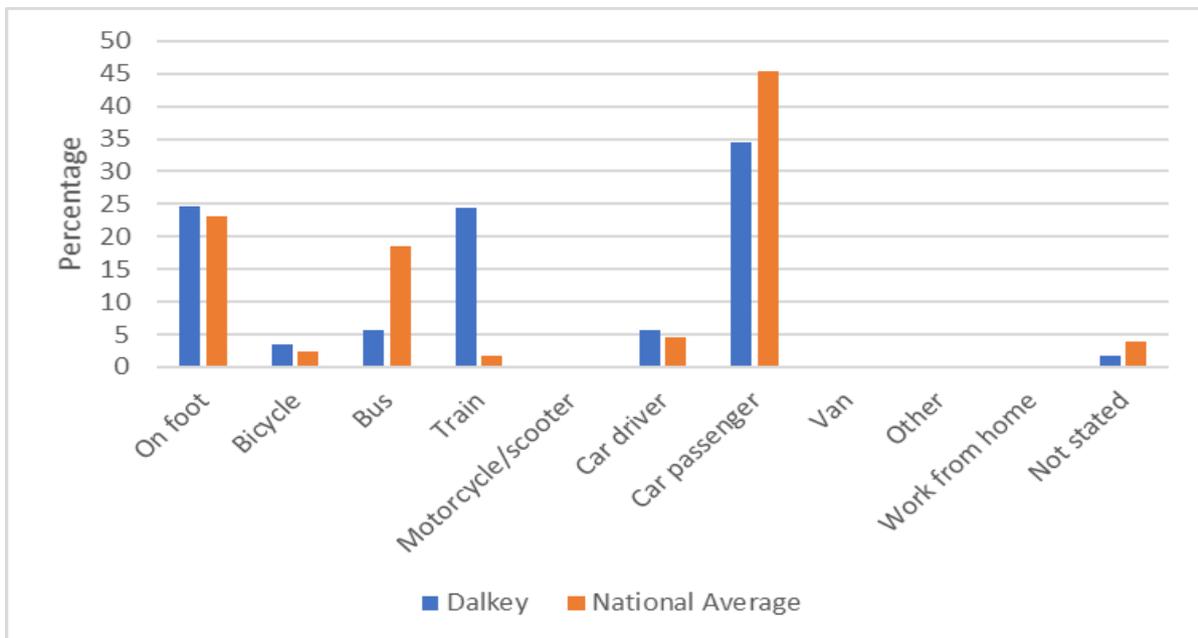


Figure 10- Means of travelling to school

From the 2016 census data we can see that the majority of residents travel to work or school by car, with 48% of residents travelling to work by car and 34% of students travelling to school or college as a car passenger. As mentioned previously Dalkey has relatively good public transport connections and this could be why the Train/DART and bus was the second most popular method of transport to work or school with 27% of residents using public transport to travel to work and 30% of students using public transport to travel to school or college.

5.3 Bike Rack Audit

In order to see a decrease in private cars on the road in Dalkey, Dalkey SEC understands that first the amenities that allow people use other methods of travel must be available. Thus Dalkey SEC has put forward a plan to add new bike racks to the area. Currently Dalkey has 99 individual bike parking stands. Figure 11 and Table 3 relay the location and number of stands at each location.



Figure 11 - Location map for bicycle parking stands in Dalkey

	Public Bike Parking Stands	
1	Barnhill Stores	2
2	Square about (beside "Dalkey Duck")	4
3	Square about ("Small Door Café")	4
4	Cuala, Hyde Park grounds	15
5	Dalkey Castle	2
6	AIB	2
7	Railway Station front	3
8	Railway Station, Ardeevin	1
9	Coliemore Harbour	5
10	Vico Road	20
11	Woodland Cafe, Killiney Hill	5
12	Killiney Hill, Burma Road Car Park	5
13	Burma Road Playground	5
	Other Bike Parking Stands in Dalkey	
14	Fitzpatrick Castle Hotel Car Park	10
15	Church of the Assumption Car Park	6
16	St Patrick's Church Car Park	10
	Total	99

Table 3 – Bike Parking Stands in Dalkey SEC

6 Community Survey

Dalkey SEC carried out a very successful survey of local residents with a hundred respondents. The survey served a dual function of capturing information on attitudes and behaviours in relation to sustainable energy and, engaging with and recruiting households and individuals to the SEC. The 100 respondents represented a significant level of engagement despite the difficulties presented by COVID-19 restrictions. 48 of these provided contact details and expressed an interest in potential involvement in possible Communities energy efficiency projects. The full survey results are contained in Appendix 5 with some extracts and commentary following.

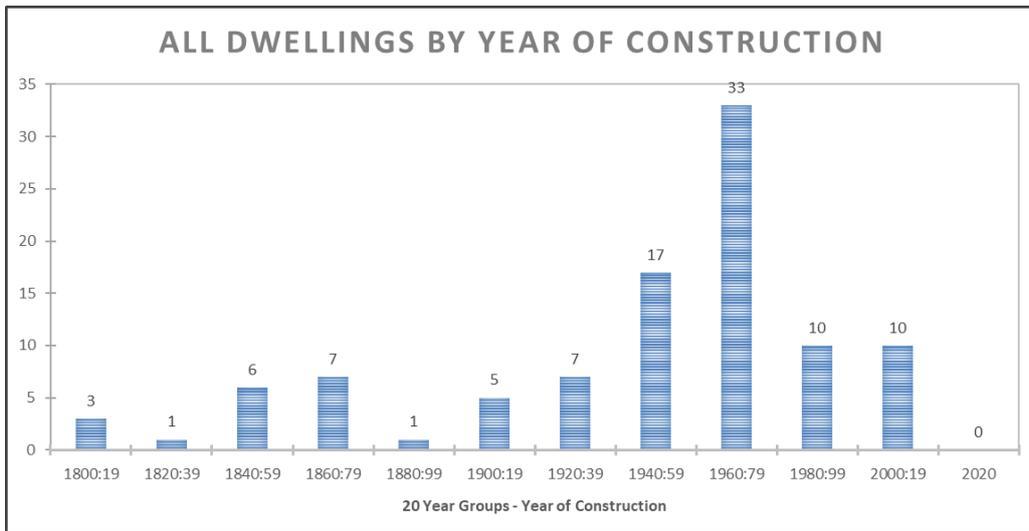


Figure 12- Year of construction of dwellings surveyed

Figure 12 shows the age distribution of the houses surveyed. The profile does not match that of the whole SEC exactly (see Figure 5) but 80% of the houses are pre-1980 compared to 81.7% of all dwellings in the SEC. As with the entire SEC, this indicates a good scope for potential energy efficiency upgrades. 40 respondents provided a BER rating for their house. Thirty had a rating of C or worse and 9 have a rating of E1 or worse. Based on SEAI data (Section 3.3) the average BER in the SEC is D2, so the BER of the respondent sample is slightly better than in the entire SEC. However, the BER distribution of the survey still indicates a good potential for energy efficiency gains.

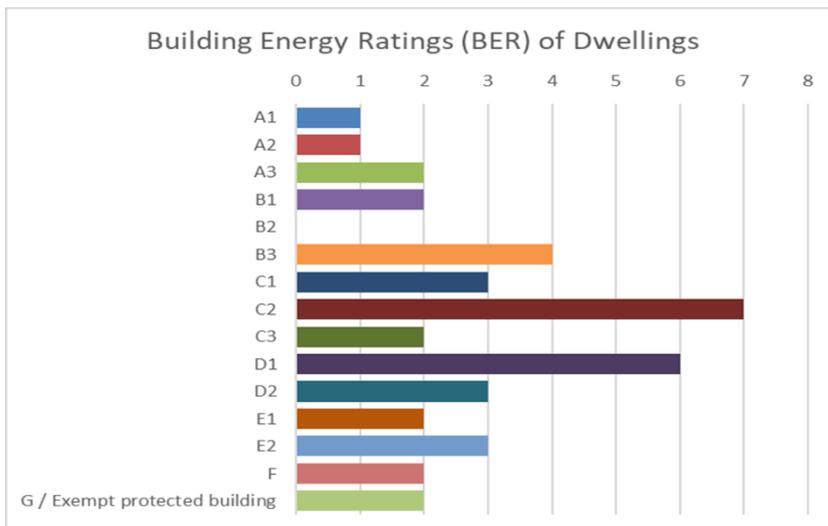


Figure 13- Distribution of BERs

Respondents are generally satisfied with comfort levels in their homes with 72.1% being quite comfortable or extremely comfortable, but, notwithstanding this, 83.6% think that improving energy efficiency would improve comfort levels. 72.8% think that an energy efficiency upgrade would increase their home's value. This follows through to the potential to invest in energy efficiency with 54.1% of respondents being very likely or extremely likely to invest in energy efficiency.

When asked if planning to invest in energy efficiency measures within a year 44% either declined to respond or responded in the negative. 33% expressed an intention to implement measures from the starter package and 21% from the standard package.

This represents a significant potential pipeline of projects and Dalkey SEC will maintain contact with the respondents who provided contact details to encourage and facilitate projects.

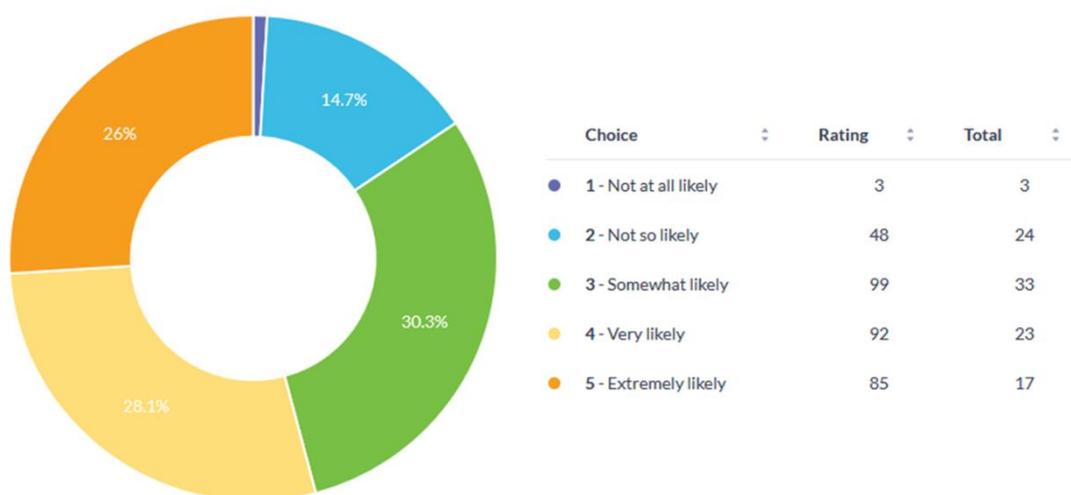


Figure 14 Potential to invest in energy efficiency

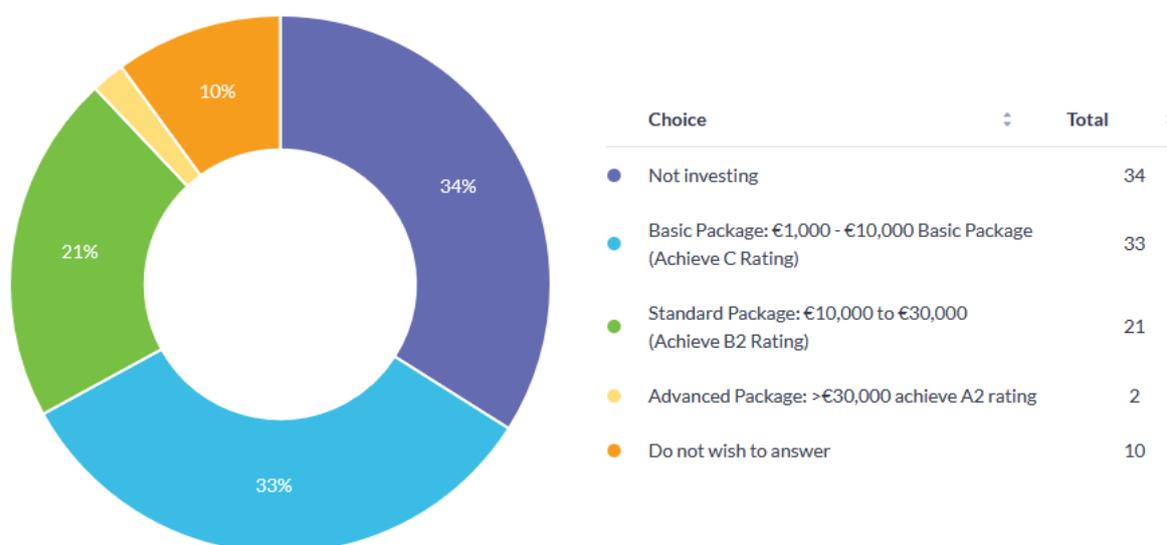


Figure 15 Likely budget for investment in energy efficiency in the next year or so

Energy Management Action Plan

Community Engagement

Community Engagement on sustainability in Dalkey is the cornerstone for success of the initiatives identified to achieve behavioural change which can result in energy and environmental gains within the community. There is a great opportunity to capitalise and build on the current interest in environmental issues: climate change, sustainable energy, biodiversity and plastic/other waste and to plan and implement a path to a sustainable community.

The SEC is led by Dalkey Tidy Towns which has a significant reach into the community demonstrated by 1) the successful '*Save Energy at Home*' show and 2) the significant response to the Community Survey. Dalkey SEC intends to build on and extend this engagement.

Generic Energy Audits

The approach in the EMP has been to develop energy audits that provide examples and identify energy saving opportunities for typical houses and businesses in the area. This will then be a source of information for anyone considering energy retrofits and will provide a path to action.

Website, Social Media and Community Newsletter

The Dalkey Tidy Towns Facebook page (1,926 followers) and Website will be used to promote the SEC as more initiatives are taken, more projects are completed and the SEC expands and develops. Dalkey SEC also use the Dalkey Open Forum Facebook page which has around 12k. followers to further extend its reach. Extensive use is made of the Dalkey Community Council Newsletter, a monthly publication delivered to every household and business in Dalkey with a circulation of 3,000. The SEC often contributes articles to the Newsletter discussing climate change issues and raising energy saving awareness.

Following completion of the EMP and energy audits and delivery of the first exemplar SEC projects, the marketing of the SEC via social media and other routes will be accelerated. As with other areas, the specialist expertise of community members will be utilised in social media campaigns.

Some Early Successful Achievements

In the course of carrying out energy audits, it was noted that some residents and some commercial premises were paying over-the-odds for their utilities. Dalkey SEC identified a mechanism which demonstrates where savings can be made and this is promoted through the publication of "how-to-save energy tips" and running a "switch and save" campaign. The latter draws attention to monetary savings for both the residential and commercial sectors that can be obtained by switching electricity and gas providers. Particularly in relation to electricity, promoting and encouraging people to move to those suppliers that give renewable energy commitments. The savings achieved by those individuals who switch could be used to part-fund retrofit measures. One business and a number of householders have already switched and are achieving savings.

Shows and Events

A very successful inter-active '*Save Energy at Home*' show was held on 8 March 2020 with almost 500 attendees.

The Show had three elements: 1) Retrofit and associated Exhibitors, 2) Speakers presenting & promoting all aspects of energy conservation and 3) An Exhibition of local children's creative art with a theme '*Save Energy at Home*'.

Promotion for the Show began on 27 January 2020 on our Facebook page, as well as the Dalkey Open Forum page, with a "Save the Date" post. Altogether 24 posts were made, initially every few days but as the show date came closer, posts were made daily.

The posts consisted of a variety of energy tips, details of the retrofit and other show exhibitors or the entertainment at the show. Each post would include the time, date and venue of the show as well as tags for SEAI, DLRCC and Dún Laoghaire-Rathdown Environmental Network. The post would also indicate that entry to the event was free.

On the day of the show we made some posts as a reminder that the show was in progress. After the show we posted photographs of the winners of the children's creative art competition and posted several photos of the day.

There were 3 Facebook posts asking residents who live in Dalkey to fill out the online energy survey.

The home page of the DTT's website was used to inform the community about the Show. It too was also used to request Dalkey residents to complete the online Energy Survey.

Apart from publicising the show itself, the community newsletter was used to promote the children's art competition and an entry form was included. In the March edition of the newsletter the show was again advertised as a reminder.

The Show details were published in the local churches as well as being announced at the various church services.

Flyers were left in various businesses around the town, posters were placed in shop windows and sandwich boards were placed on the pavement on the day of the show.

Other Publicity Initiatives for the show

In order to engage with the only secondary school in the area, DTT invited an enthusiastic 'Climate Change' Transition Year student to speak at the show on what input she contributed to energy decisions in her home. Subsequently, she was nominated and went on to win the SEAI's "Emerging Sustainable Energy Champion 2020".

The Children's Art Competition was targeted at the 4 primary schools in Dalkey. By announcing winners at the show, this encouraged parents and guardians to bring their children along on the day which greatly helped to boost overall numbers attending.

DTT gave a presentation in February 2020 to the Dalkey Ladies Club about the Energy Master Plan and the upcoming Show.

Further workshops will be held to promote community engagement and to progress specific identified projects to implementation either through a Communities project or independently.

The workshops will inform the attendees of the SEC activities, opportunities for participation and contribution and in identifying and considering potential energy efficiency projects. The requirement to achieve a B2 BER for households in the Communities grant programme is challenging but projects could at least proceed through Better Energy Homes grant.

Maintaining a Register of Opportunities

Through the workshops, promotional activity and dissemination of exemplar projects the SEC will continue to build and develop the pipeline of projects for the Register of Opportunities. Dalkey will continue to engage with businesses in the area including those businesses which have already expressed an interest in participating in any relevant projects.

The 10 dwellings for which residential audits have already been carried out, as well as the 100 community members who responded to the survey, is a significant start to a 'Register of Opportunities' that has the potential to lead to projects and exemplar case studies.

7 Register of Opportunities

The Register of Opportunities (RoO) primarily comprises the accompanying excel spreadsheet which is designed to record potential projects through identification, commitment and implementation.

The Register of Opportunities for residential has been developed as a template for specific houses and projects with a general register of opportunities for the sector. The register should be populated with households committed to and implementing energy efficiency projects as they are identified.

The RoO for non-residential records potential projects identified through Energy Audits and similarly allows tracking from identification through to completion.

Appendix 2 contains extracts from the RoO.

7.1 Residential Register of Opportunities

The housing in Dalkey is mainly owner occupied with 1,964 dwellings being owner occupied (64.9% of households responding). There are 382 households renting from private landlords (14.8% of total households) and 117 local authority (4.5% total households). The main targets for energy efficient upgrades are owner occupied and local authority housing.

For owner occupied dwellings, the engagement of householders and recruitment for deeper engagement will be on an individual basis. Each householder will personally fund the works in their house and the recommended actions must be flexible and avoid being too prescriptive. A suite of measures from which householders may choose, depending on their budget and personal preferences will assist householders in making informed decisions and in meeting the objectives of Dalkey.

As noted from the CSO data, the majority of houses are privately owned where the owner can make decisions, fund and benefit from retrofit works. However, the rental sector (accounting for 14.8% of housing) presents more of a challenge as the landlord responsible does not directly benefit from the upgrade other than enhancing the value of the property. Local authority housing is an area where collective improvements may be achieved.

Dún Laoghaire-Rathdown County Council fully supports the Dalkey SEC in the development of its Energy Master Plan. This is aligned to the Council's own Climate Change Action Plan 2019-2024, which contains a variety of actions across the five theme areas of Energy & Buildings, Transport, Flood Resilience, Nature Based Solutions and Resource Management (see Appendix 7 for more details). Having particular regard to the Sustainable Energy Roadmap and Register of Opportunities sections of the EMP, the Council is committed to collaborating with Dalkey SEC, in the identification of Council buildings that could be included in the future implementation of the EMP and associated funding opportunities.

Engagement with the community and recruitment of householders planning upgrades is essential to achieving these goals.

A householder may choose to implement a starter package of measures without major cost and disruption. However, a standard or advanced package is a bigger investment and a more complex project and could be carried out as part of a general refurbishment or an extension project than as standalone measures.

It is important therefore to capture houses where refurbishment work is planned to provide the option of grant aided energy efficiency measures. This could be done through general engagement and awareness, estate agents and planning searches.

In summary:

- The ambition to reduce energy consumption in owner occupied and local authority housing in line with national goals over the next ten years is challenging and entails, on average, a standard measure of packages.
- Engagement and recruitment of householders is key to achieving the targeted savings as is capturing interest and activity (e.g. works carried out under Better Energy Homes grant).
- Packages of measures must be flexible and must be adaptable to householders' preferences and budgets.

There are ambitious National targets for retrofits in dwellings including the plan to retrofit 500,000 dwellings to B2 by 2030 stated in the Climate Action Plan (App. 7). This equates to approximately 25% of the National housing stock. Applied to Dalkey SEC it equates to about 750 houses in total or 75 per annum. Dalkey SEC plans to meet and possibly exceed these National targets.

7.1.1 Domestic Audits

Audits of 10 households were carried out to determine the Building Energy Rating (BER) and to demonstrate measures and packages of measures as a pathway to improving energy efficiency. The houses were selected based on representativeness of typical house types in the DSEC area. They are referred to DSEC1 to DSCE10 to preserve anonymity. The average BER of the houses surveyed is a D2, which reflects the average BER in the wider SEC which is also D2. Figure 16 shows the BER bands in kWh/ m²/yr.

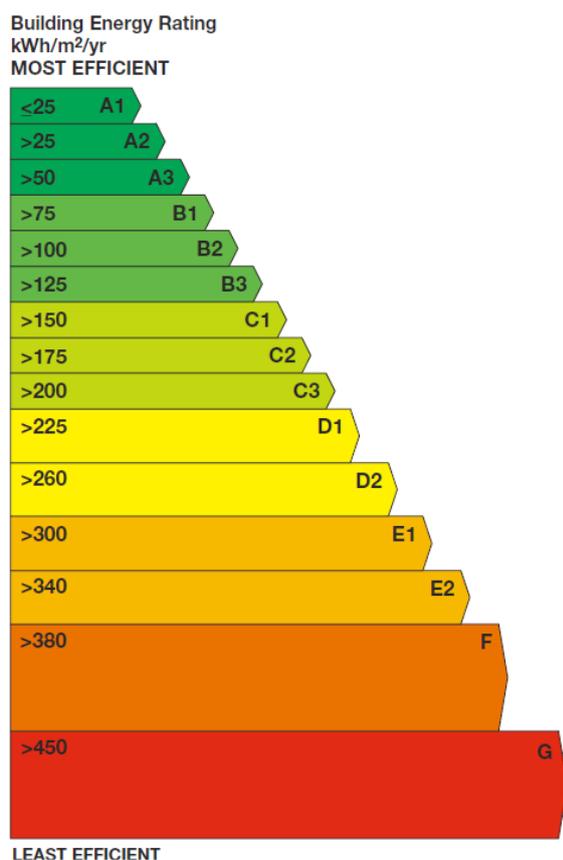


Figure 16 – BER grade ranges

The domestic energy audit reports were intended to provide a generic template for representative audits rather than being particular for one dwelling. So, for example, a house built in the 1930's may be likely to have upgrades including the installation of a central heating system, possibly an

energy efficient boiler, double glazing perhaps and a degree of roof insulation at some stage. The houses do not typically have substantial levels of existing wall insulation or solar PV or heat pumps.

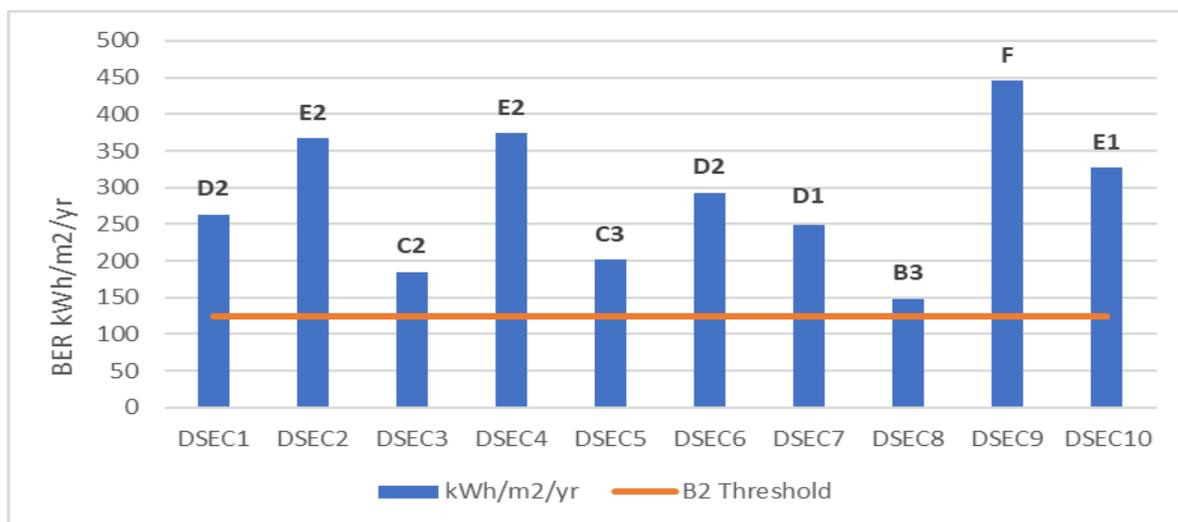


Figure 17 – BERs of Houses Surveyed

Table 5 below summarises the measures recommended for starter, standard and advanced cost packages in the house types surveyed. Cells coloured green indicates recommended for all house types, pink for no house types and grey for some house types. The full audit reports are contained in Appendix 3 where specific recommendations can be seen. Figure 17 shows the percentage improvement in energy performance for the starter investment, standard investment and advanced investment packages. The combined average saving across all 10 houses is 49% for the standard package and when the advanced package is applied the saving is 75%.

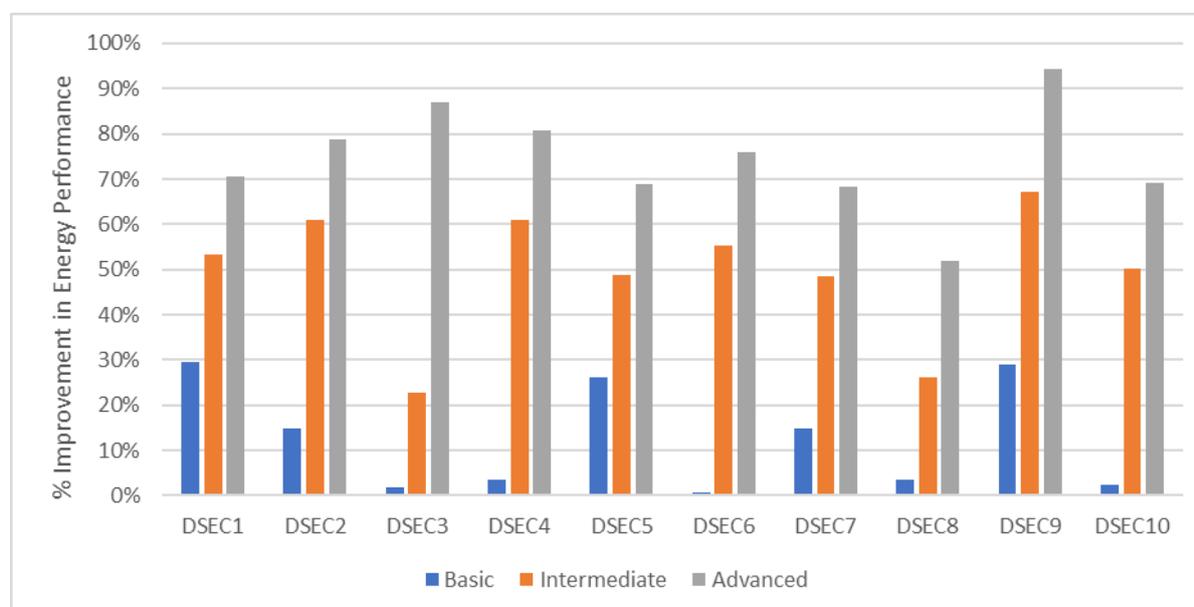


Figure 18 – Energy performance improvement for retrofit options

The measures are generally self-explanatory and the detail for individual houses will tend to be bespoke. There is a brief discussion on some of the measures following and more information is available in SEAI's Upgrading to an A-Rated Home Guide.

Wall insulation is recommended for standard and advanced cost packages for houses that have some existing wall insulation. External wall insulation (EWI) is generally recommended for houses without any wall insulation.

In striving to achieve a B2 BER, where gas central heating/water heating already exists but old boilers are present, it is recommended to upgrade to a modern condensing boiler in the "standard package". It should be noted that energy efficient condensing boilers do not attract grant aid but are required by building regulations. If or when an "advanced package" is being undertaken it is recommended that all houses install a heat pump.

Up to three sets of measures are shown for each package (starter, standard and advanced). The starter package typically includes lower cost measures such as low energy lighting and measures that don't conflict with additional deeper measures that might be implemented at a later stage. The standard package includes wall insulation, a condensing boiler and heating controls.

House ID	DSEC1	DSEC2	DSEC3	DSEC4	DSEC5	DSEC6	DSEC7	DSEC8	DSEC9	DSEC10		
	Starter	Standard	Advanced									
Measure												
Low energy lights		Y Y Y		Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y		Y Y Y	
Attic/Lightwell Insulation	Y Y Y			Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y		Y Y Y	Y Y Y	
Roof Insulation		Y Y Y					Y Y Y		Y Y Y			
Heating Controls	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y		Y Y	Y Y	
Internal wall Insulation												
External wall insulation	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y
Condensing Boiler		Y		Y			Y			Y		Y
Stove			Y		Y							Y
Windows		Y	Y	Y	Y	Y	Y		Y	Y	Y	Y
Floor Insulation				Y								
Doors		Y	Y		Y	Y	Y		Y	Y	Y	Y
A/W Heat Pump		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Solar Photovoltaic				Y						Y	Y	Y

Table 4 – Recommended Measures and Packages

	Starter Package ⁵	Standard Package	Advanced Package
Low Energy Lights	Yes	Yes	Yes
Roof/Attic Insulation	Yes	Yes	Yes
Heating Controls	Yes	Yes	No
Wall Insulation ¹	No	Yes	Yes
Condensing Boiler	No	Yes (if applicable)	No
Wood Stove	No	No	Yes (if applicable)
Windows	No	No	Yes
Floor Insulation	No	No	Yes (if applicable)
Doors	No	No	Yes
A/W Heat Pump	No	No	Yes
Photovoltaics	No	No	Yes (if applicable)

Table 5 – Summary of Recommended Measures

7.1.2 Residential Costs and Incentives

The average investment cost and savings for the households surveyed are listed in Table 6. The starter and standard packages attract fixed rate grants through the Better Energy Homes and the advanced package attracts a 35% grant through the Communities or National Retrofit programmes (excluding those measures that are not grant aided).

⁵ For SEAI Community grant the minimum post works is B2 which will define a minimum package and will exclude the starter package from the Communities grant for most homes. Building Regulations also require a minimum B2 rating if over 25% of the fabric is being altered (eg wall insulation). Individual measures can still be funded through the Better Energy Homes scheme.

There is clearly a substantial investment from the householder but the grant levels assist financially and provides an opportunity to improve comfort, reduce energy costs and enhance the value of houses. Funding through credit union loans or other financing mechanisms may also be available.

	Average Cost	Cost After Grant	Average Saving per Year	Payback (Years)
Starter	€4,040	€3,720	€424	8.8
Standard	€20,653	€13,727	€1,844	7.4
Advanced	€46,574	€30,588	€3,177	9.6

Table 6 – Average Costs and Savings for Retrofit Packages

Table 7 summarises estimated typical costs of measures together with grant levels. The grant levels are for the SEAI Better Energy Homes (BEH) and for the SEAI Communities grant and the SEAI National Home Retrofit Scheme (HNRS)⁶. The cost are general estimates and costs can vary significantly from house to house.

	Typical Cost	Better Energy Homes	Communities/ NHRS
Starter			
Low energy lights	€100	NA	35%
Roof/Attic insulation	€500-€1,000	€400	35%
Heating Controls	€600	€700	35%
Standard			
Cavity Wall Insulation	€1,000	€400	35%
External Wall Insulation	€10,000 - €20,000	€2,750-€6,000	35%
Internal Wall Insulation	€10,000 - €15,000	€1,600-€2,400	35%
Condensing Boiler	€3,500	NA	NA
Wood Stove	€3,000	NA	
Advanced			
Windows	€10,000-€20,000	NA	35%
Susp. Floor insul.	€2,500	NA	35%
Doors	€1,000-€2,000	NA	35%
A/W Heat Pump	€12,000	€3,500	35%
Photovoltaics	€2,500-€5,000	€900/kWp ⁷	35%
Solar Thermal	€3,000-€5,000	€1,200	35%

Table 7 - Costs of Measures and Grants Available

⁶ <https://www.seai.ie/grants/national-home-retrofit/>

⁷ You will receive €300 for every additional kWp over 2 kWp up to 4 kWp if you get a battery. Total grant available capped at €2,400.

The grant levels for works done under the Better Energy Homes scheme (BEH) and the Communities grant are similar although there are more individual options in the Communities and NHRS grants. For these grants a house must achieve a minimum B2 rating. A householder will need to implement a package of measures to achieve a BER rating. In general, wall insulation is required to achieve B2 plus additional measures such as solar PV or a heat pump.

It is likely that a number of houses will carry out works, particularly a low cost package of measures, under the BEH scheme and Dalkey should capture this activity in performance monitoring assessment for the SEC.

The suite of measures in the starter package is generally applicable across all households and includes:

- Increase roof/attic insulation
- Energy efficient lighting
- Heating controls upgrade

The standard and advanced packages include:

- Wall insulation (generally external)
- Wood burning stove replacing open fire
- Double/Triple glazed windows (U=1.4)
- Condensing boiler

The advanced packages include:

- Heat pump
- Solar PV

7.2 Commercial and Public Sector

7.2.1 Overview

The tertiary industry is the segment of the economy that provides services to consumers. There are several different types of service industries located in Dalkey including a number of restaurants, four primary schools, a secondary school, nursing homes, library, heritage centre, health centre, doctor and dentist surgeries, pharmacies, banks, many small offices such as accountants, solicitors and several pubs. There are multiple retail outlets located in Dalkey including supermarkets, dry cleaners, petrol station, news agents, book shop, estate agents, cafes, bookmaker, dry cleaners, health food store, butchers, jewellers, photographers, art gallery, hairdressers and beauty salons.

Total commercial energy consumption is estimated at 11,225,475 kWh/yr. While there is a considerable range of commercial operations within Dalkey there are very few which can be classified as large commercial energy users. Engagement with commercial operations should be considered as this sector provides opportunities for significant energy savings with fewer sites (when compared to residential) and can improve the value for money assessment in a SEAI Communities grant application.

Community organisations such as sports clubs are valuable demonstrators, where energy efficiency projects promote awareness of the SEC and of energy efficiency in the community. Likewise, schools act as educators and promote the concept of energy efficiency. Projects in these types of organisations therefore have a multiplier effect and are encouraged in SEAI's community programme.

During the development of the EMP and RoO we sought to identify and engage with commercial and public sector organisations that might be suitable for energy efficient retrofits. Commercial and Public Sector buildings were identified through the Valuation Office and through local knowledge.

Preliminary site surveys of the following sites were carried out:

- Dalkey Pharmacy
- Harold Boys National School
- Cuala GAA Club

7.2.2 Energy Consumption in sites surveyed

Table 8 following summarises the annual electricity and gas consumption for Dalkey Pharmacy, Harold Boys' School and Cuala GAA. The estimates are based on actual bills over 2019 and into early 2020 prior to the introduction of COVID related restrictions.

Site	Energy Source	kWh/yr	€/yr
Dalkey Pharmacy	Electricity	13,475	€3,110
Harold Boys School	Electricity	20,054	€3,734
	Gas	68,778	€4,085
Cuala GAA	Electricity	27,685	€4,763
	Gas	4,722	€295

Table 8 – Energy Consumption in Tertiary Sites Audited

7.2.3 Energy Uses and Retrofit Opportunities

Low Energy Lights

Lighting is a significant energy use in all buildings. Switching to lower energy lighting such as LEDs will lower bills. For example switching a typical double linear fluorescent fitting (139W) with a 60W equivalent LED fitting would reduce electricity consumption by 57% and replacing a 50W halogen lamp with a 6W equivalent LED would save almost 90%. LEDs using approximately a 60-80% of the energy of alternatives thus also reducing your carbon footprint. Furthermore, LEDs last up to ten times longer than halogen bulbs. Cuala has already upgraded their lighting to LED and is projected to save 3,500 kWh/yr as a result.

Heating Controls

Space heating is the largest energy use in most buildings. Upgrading the heating controls of a building results in a warmer, more energy efficient structure. By installing heating controls energy usage can be reduced by up to 20% and save money on your heating bills. For example, zoned controls with independent time and temperature control allows heat supply to be targeted to only those areas that need heating, thus cutting out unnecessary energy usage.

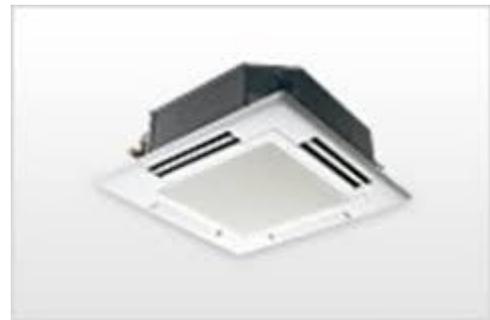
Heat Pump

For buildings with existing direct electric heating (eg storage heaters) installing an air to air heat pump, sometimes called a split system air conditioner, would improve efficiency. A heat pump would have a typical efficiency of up to 500% compared to the efficiency of less than 100% for storage heaters. It would also be easier to control and more responsive to demands and

would improve comfort.

Solar PV

Solar photovoltaic (PV) is an option for many buildings. See Section 9.2 more information.



Typical Indoor Unit for Air to Air Heat Pump

8 Renewable Energy and Active Consumers

8.1 Renewable Energy Sources

Renewable sources of energy are the cleanest source we can produce in terms of greenhouse gas emissions and increasing the proportion of energy sourced from renewable sources is central to national and EU energy and climate change policy. Renewable Energy Sources include:

- **Solar Photovoltaic**
Solar PV panels convert energy from light directly into electricity. The cost of solar PV panels has fallen by around 90% in the past 10-15 years making the business case for solar PV a reasonable investment.
- **Solar Thermal**
Solar thermal panels convert the energy from sunlight into heat, usually for domestic hot water. It is a proven and reliable technology but possibly has a longer payback than solar PV. It is also slightly more complicated to install in existing buildings.
- **Wind**
Wind turbines convert energy from the wind into electricity. Larger 'utility scale' wind turbines are common. There are small scale wind turbines available, but these work best in rural areas with uninterrupted wind flows. Turbulence from building and other obstacles reduces the yield from small wind turbines significantly.
- **Tidal or Wave**
Technologies exist to capture energy from tidal differences or flows. These tend to be of a scale and cost that is beyond that of community projects, but Dalkey Sound has very strong currents that could be of interest in the future. Wave powered generation is at an early stage of development and probably not of interest in this area.

8.2 Solar Photovoltaic

Solar PV panels are those that generate electricity when exposed to light. They are the rooftop solar you see on roofs and businesses. There are numerous benefits to switching to a solar PV system. These benefits include lower electricity bills and an improved BER. Thus, when it comes to selling your home, a higher BER will add value and help you achieve a higher sale price, as well as reducing your energy waste. Using a solar PV system means you are generating your own renewable energy. This has great benefits for our environment and lowers your greenhouse gas emissions.

Solar PV panels are rated in kWp (kW peak). By definition, 1 kWp generates 1 kWh of electricity per kWh/m²/yr of solar insolation. The average solar insolation in Ireland is 962 kWh/m²/yr.

The electricity produced by the PV module in kWh/year is

$$\text{Solar Output (kWh/yr)} = 0.80 \times \text{kWp} \times S \times ZPV^8$$

where S is the annual solar radiation (kWh/m²/yr), ZPV is the overshadowing factor and 0.8 is a factor accounting for system losses.

⁸ SEAI Dwelling Energy Assessment Procedure

Tilt of collector	Orientation of collector				
	South	SE/SW	E/W	NE/NW	North
Horizontal	963				
15°	1036	1005	929	848	813
30°	1074	1021	886	736	676
45°	1072	1005	837	644	556
60°	1027	956	778	574	463
75°	942	879	708	515	416
Vertical	822	773	628	461	380

Figure 19 – annual solar radiation (insolation) for different orientations and tilt (SEAI)

So, according to SEAI's methodology, a 1 kW unshaded, south facing solar PV installation at a tilt of 30 degrees would yield 859 kWh per annum.

The European Commission has developed a simple online PV calculation [PVGIS](#). According to PVGIS, the yield for a 1 kW south facing, 30 degree tilt solar PV installation in Dalkey would be 930 kWh/yr.

A reasonable rule of thumb would be around 900 kWh per annum for a 1 kW solar PV system. The value of this electricity is the marginal cost of electricity, that is the daytime unit rate paid.

Cost-Benefit and Supports

Solar PV installations can cost from €2,200/kW to €1,000/kW depending on size. A 3kW system would cost around €6,000 while a 6 kW system would cost around €9,000 so there are economies of scale. A solar system has generally been designed around on site demands and to avoid excessive export in the absence of an export tariff.

There is currently a proposed Microgeneration Support Scheme which will provide an export tariff. Details remain to be finalised but the proposal is to provide a Clean Export Guarantee tariff which would be set at the wholesale market rate for electricity and a Clean Export Premium which will be set at a level to incentivise solar PV.

At present, the installation of solar photovoltaic (PV) panels can be funded through the SEAI community grant or the domestic Solar PV grant.

In order to be eligible for the SEAI's solar PV grant the dwelling must be built and occupied before 2011 and must have a BER rating of C or greater. As part of the advanced package, the solar PV grant would be included. For a solar PV grant one would receive €900 per kWp up to 2 kWp and €300 for every additional kWp up to 4kWp if you get a battery. For example, you will receive €1,800 for 2kWp solar panels (ie 6/7 solar panels). Battery energy storage systems are used for larger solar PV systems, so that the excess electricity generated during daytime hours can be used at another time. They are only recommended for suitable dwellings and can receive a grant of €600..

8.2.1 Planning Requirements

SI 83 of 2007 provides for planning exemptions for solar PV or solar thermal installations on domestic sites. There are a number of stipulations:

- Total panel area must not exceed 12 sq. m or 50% of the total roof area including existing panels.

- The distance between the plane of the wall or pitched roof and the panel must not be more than 15cm. The distance between the plane of a flat roof and the panel must not exceed 50cm.
- The panel must be a minimum of 50cm from the edge of the wall or roof on which it is mounted. A free-standing array's height must not exceed 2m above ground level.

There are similar exemptions, and stipulations, (under SI No. 235 of 2008) for non domestic solar up to a total area of 50 m².

8.2.2 Heat Pumps

An alternative to fossil fuel heating systems is an air source (AS) heat pump which would offer lower running costs and reduced carbon emissions. Heat-pumps are electrical devices which convert energy from the air outside of your home into useful heat. They are an extremely efficient supplementary system in retrofit situations to reduce reliance on oil, gas, solid fuel and electric home heating systems and thereby reduce your carbon footprint.

One of the requirements for a dwelling to qualify for a heat pump system grant is that the dwelling has a low heat loss. This requires buildings to be correctly insulated to a high standard. The efficiency performance of the heat pump depends on buildings having a Heat Loss Indicator (HLI) of at least 2.0 or under. This is to ensure your heat pump system performs well and ~~you~~ and does not adversely affect your electricity bills. Once again this is why it is recommended in the advanced package of domestic retrofit measures. The grant for an air source heat pump through the SEAI is €3,500. The insulation required is also grant aided.

8.3 Energy Communities and Active Consumers

The Clean Energy for all Europeans Package (CEP) contains provisions for the empowerment of individuals and groups of consumers seeking to participate in the electricity sector.

The Commission for Regulation of Utilities (CRU) recently published a paper titled "Energy Communities and Active Consumers" in which they define a 'citizen energy community' as a legal entity that is based on voluntary and open participation and is effectively controlled by members or shareholders and has for its primary purpose to provide environmental, economic, or social community benefits to its members or shareholders or to the local areas where it operates rather than to generate financial profits; and, may engage in generation, including from renewable sources, distribution, supply, consumption, aggregation, energy storage, energy efficiency services or charging services for electric vehicles or provide other energy services to its members or shareholders.

When appropriate market and regulatory arrangements are instituted this will give communities such as Dalkey the opportunity to become energy independent. This has already been achieved by Samsø, an island in Denmark. They managed to become 100% green by working on community projects such as solar and wind farms.

Supports are available for Community Energy initiatives including the following.

- Renewable Electricity Support Scheme (RESS)

The Renewable Electricity Support Scheme (RESS) has been set up by the government to promote investment in renewable energy generation in Ireland. RESS is a competitive auction based framework will help achieve Ireland's targets for electricity generation from renewable sources by 2030. RESS is designed to help deliver community participation through community-led projects and community benefit funds.

Community-led projects can apply for RESS if they meet the following criteria⁹:

1. Application must be made in conjunction with a Sustainable Energy Community (SEC) such as the Dalkey SEC;
2. Project size must be between 0.5 and 5MW;
3. For RESS-1 projects, Community-Led Projects must be majority owned (51%) with the primary purpose of generating community benefit (environmental, economic or social) rather than just financial profit. (The other 49% can be motivated by profit, for example held by a project developer interested in making a return on funds invested and risks taken);
4. The Community group must be based on open and voluntary participation; and,
5. Participation to be based on local domicile.

This latter criterion limits participation based on proximity so the renewable energy project would need to be close to Dalkey SEC to qualify¹⁰. There are presently proposal to open up for citizen and community participation in renewable energy projects and Dalkey SEC is monitoring these developments in the hope of being able to participate in community power initiatives.

- Community Benefit Funds

A mandatory Community Benefit Fund must be provided by all projects successful in a RESS auction. The contribution is to be set at €2/MWh generated by successful projects. The Fund will be targeted at encouraging investment in local renewable energy, energy efficiency measures and climate action initiatives. The community benefit fund under RESS-1 will deliver approximately €4.5million a year to sustainable community initiatives targeted at those communities living in close proximity to the RESS-1 Projects.

The Developers of the Dublin Array have indicated (see Dublin Array website) a willingness to provide community funding that will help adjacent communities to pursue renewable energy projects or other energy efficiency initiatives.

⁹ The above criteria are based on the terms and conditions of RESS-1 and are subject to change under future auctions. In February 2021 it was announced that Community-led projects seeking to apply to future RESS auctions, must be 100% owned by the community (to gain 15-year support from Government in the form of a premium on top of the market price), as opposed to being majority owned as outlined above for RESS-1.

¹⁰ RESS requires that Community projects must be owned by a Renewable Energy Community. The exact definition of a Renewable Energy Community is part of a wider consultation on Energy Communities and Active Consumers. One proposal is based on connection to the same 38 kVA substation.

The results of RESS-1 (the first auction under the new regime) will be announced in the near future and the level of funding being made available to communities should become more visible.

8.4 Smart Meters

A Smart Meter measures electricity usage, similar to a traditional meter, without the need for estimated meter readings. With Smart Meters, you no longer have to submit readings or have someone read the meter. Smart meters will help people understand better the way electricity is consumed in their homes and about the sources of electricity. Smart digital meters will give people control and more choice when it comes to their energy practice.

For example, a smart meter allows a person to change their energy use to a time when the grid is not under pressure or supplied mostly with renewable energy and therefore has lower electricity tariffs and cleaner energy. The installation of smart digital metering has already commenced across Europe and internationally.

The phased rollout in Ireland started in 2020 and will continue for four years to 2024. It is expected that around 2.3 million electricity smart digital meters will be installed in homes and businesses nationwide, replacing old mechanical meters. One can contact ESB Networks www.esbnetworks.ie/smartmeter to see when you are in line to have your smart meter installed. If you have already had a smart meter installed you should contact your supplier to enquire about time of use tariffs and smart data services available. DTT will monitor this installation in the area and promote the beneficial features of smart meters.

9 SEAI Grants

9.1 Communities Grant

SEAI's Communities Grant is generally open for applications on a first come first served basis each year. It tends to be launched for applications in the latter part of the year for delivery of projects the following year. The grant gives preferential treatment to applications with a high SEC participation. As of April 2021, the Communities grant is closed. We await announcement of the Communities Grant (or its equivalent) for 2022. In the meantime, the National Home Retrofit Scheme (NHRS), launched in 2021, is open for applicants and DSEC can promote and possibly avail of it as part of our objectives. (The NHRS grant is similar to the Communities grant but does not include non-domestic projects).

Dalkey SEC and interested householders should contact project co-ordinators¹¹ and one-stop shops¹² to discuss potential projects and the possibility of including projects in Dalkey SEC in a grant application.

Main points of the Communities Grant scheme include:

- Fossil fuel boilers are not grant aided.
- The minimum post works BER for dwellings is B2 (<125 kWh/m²/yr)
- Community Grant levels are 30% for non-domestic and 35% for domestic. Higher grant levels are available for fuel poor households and for voluntary community organisations as well as schools and some other non-domestics which may qualify for a 50% grant. See SEAI's website for further details.
- A project co-ordinator needs to assemble various projects and submit an application which, when aggregated, meets the schemes criteria.

For the SEAI Community grant, the minimum post works BER of B2 will determine whether a household/business is included in the application. (Building Regulations also require a minimum BER of B2 where >25% of the total building fabric is upgraded).

The average post works BER for the standard package for the 10 houses surveyed getting is 134 kWh/m²/yr which is just above the minimum B2 requirement. Only three of the houses will achieve the requirement with the standard suite of works alone. Therefore, the standard package, and in some cases a little more than the standard packages, will be required as a minimum to meet SEAI's requirement for the Communities or NHRS grant. For example, adding solar PV to any of the standard packages would ensure compliance with the B2 standard.

Dalkey SEC has hopes to apply for a Communities grant in the future. This will require commitment from businesses and householders. As that commitment is achieved the RoO should be updated and an application form and workbook completed.

9.2 Better Energy Homes Grant

Individual measures can still be funded through the Better Energy Homes scheme. SEAI's Better Energy Homes Grants provide grants for selected individual measures as an alternative to the combined measures approach in the Communities and National Retrofit grants. Table 7 (Section 8.1.2) contains a list of the funded measures and funding levels.

¹¹ <https://www.seai.ie/grants/community-grants/project-coordinator/>

¹² <https://www.seai.ie/grants/national-home-retrofit/one-stop-shops/>

9.3 EXEED Grant Scheme (Commercial)

The EXEED grant scheme is appropriate for larger energy users and is designed for organisations who are planning an energy investment project. Grant support of up to €1,000,000 per project is available. SEAI provide grant support for projects which are following the EXEED Certified standard for Excellence in Energy Efficient Design. The EXEED standard encourages innovation in design projects to help future-proof the investment, by optimising energy performance, reducing operational energy costs and carbon emissions, improving competitiveness and demonstrating commitment to sustainability, which could also bring a reputational boost. The percentage of funding received is based on the size of the company with large companies receiving up to 30%, medium up to 40% and small up to 50%.

9.4 Project Assistance Grants

For a company spending over €250,000 per year on energy bills, SEAI offers grants to develop energy saving projects. The aim of these projects should be to achieve significant energy savings and build good procurement practices. Applications are taken from the public and private sector. A business can first get up to 50% funding for a feasibility study of up to €15,000. A grant of up to 75% can be attained for the final business case and project delivery.

9.5 Grant Aid Promotion

DSEC will work with households and businesses in the area to promote awareness of the grant schemes and encourage project participation using, as examples, the Energy Audits and BERs already carried out.

Appendix 1 Glossary of Terms

Term	Definition
Delivered Energy	Delivered energy is the amount of energy consumed at the point of sale (e.g., that enters the home, building, or establishment) without adjustment for any energy loss in the generation, transmission, and distribution of that energy.
Dwelling Energy Assessment Procedure (DEAP)	The Dwelling Energy Assessment Procedure (DEAP) is Ireland's official method for calculating the Building Energy Rating of new and existing dwellings.
Energy Master Plan (EMP)	The aim of an EMP is to allow a community or business to understand its current and future energy needs (in electricity, heat and transport) in order for the community or business to make informed decisions and prioritise actions.
Feed in Tariff	A payment for excess electricity generated and exported to the network. Arrangements for a feed in tariff are currently being finalised under the microgeneration scheme which is due to be launched in June 2021.
Kilowatt-Hour (kWh)	The kilowatt-hour is a unit used by energy companies to determine how much you are charged. It is equivalent to the energy used in a single bar electric heater in one hour.
Kilowatt-Peak (kWp)	kWp is the peak power of a PV system or panel.
LED Lighting	LED stands for light emitting diode. LED lights are more efficient than traditional lamps (incandescent and fluorescent) and also have a longer lifespan.
Level 1 Audit	The Level 1 audit is alternatively called a simple audit, screening audit or walk-through audit and is the most basic. It involves minimal interviews with site operating personnel, a brief review of facility utility bills and other operating data, and a walk-through of the facility, all geared toward the identification of glaring areas of energy waste or inefficiency. The data compiled is then used for the preliminary energy use analysis and a report detailing low-cost/no-cost measures and potential capital improvements for further study. Typically, a Level 1 audit will only uncover major problem areas. Corrective measures are briefly described, and quick estimates of implementation costs, potential operating cost savings, and simple payback periods are provided. This level of detail, while not sufficient for reaching a final decision on implementing proposed measures, is adequate to prioritise energy efficiency projects and to assess the need for a more detailed investigation.
Primary Energy	Primary energy is an energy form found in nature that has not been subjected to any human engineered conversion process. It is energy contained in raw fuels, and other forms of energy received as input to a system.
Register of Opportunities (RoO)	A RoO is for recording all opportunities for energy savings at a facility or in a community.

Smart Meter	<p>A smart meter offers the client more detailed information on their energy consumption as well as reducing the need for estimated electricity bills. Smart Meters provide 1/2 hourly consumption data and allow for time of use tariffs. ESB Networks started a 4 year program to install smart meters at every connection point in 2020. It is scheduled to finish in 2024. Refer to ESB Networks for more information.</p> <p>https://www.esbnetworks.ie/existing-connection/meters-readings/smart-meter-upgrade</p>
Smart Meter Device	<p>A device, other than an ESB Networks Smart Meter, installed to provide smart metering data.</p>
Solar PV	<p>A solar photovoltaic (Solar PV) system is one which converts light into electricity.</p>

Appendix 2 Register of Opportunities

Ref	Address	BER Before (Indicative)	BER After (Indicative)	BER Before (Actual)	BER After (Actual)	Floor Area	Primary Energy Saving (kWh/yr)	Status
DSEC1	Dundela		B1	D2		218	40,480	Identified
DSEC2	Barnhill/ Hillside		B1	E2		130	37,625	Identified
DSEC3	Sorrento		A2	C2		72	11,571	Identified
DSEC4	Gosworth		B1	E2		134	40,571	Identified
DSEC5	Killiney Road		A3	C3		176	24,434	Identified
DSEC6	Mount Salus		A3	D2		196	43,530	Identified
DSEC7	Pilot View		B1	D1		167	28,465	Identified
DSEC8	Barnhill		A3	B3		255	19,645	Identified
DSEC9	St. Begnets Villas		A2	F		87	36,574	Identified
DSEC10	Torca Road		A2	E1		360	81,569	Identified

Based on the BER analyses undertaken for 10 representative dwellings, indicative savings of approximately 51 Kg/m²/yr per house could be achieved if a quarter of Dalkey homes implemented the standard package of retrofits. This is roughly in line with the national target of 500,000 homes being retrofitted by 2030. Applying this figure to the overall Dalkey housing stock, this would save approximately 4,200 tonnes of CO₂ being emitted by Dalkey every year after 2030 in comparison to today's (2021) emissions.

Organisation	Opportunity	Electrical Savings kWh	Thermal Savings kWh	Value of Savings (€)	CO2 Savings	Cost (€)	Cost After Grant	Payback in Years (after grant)	Status
Cuala GAA Club	EMIS	2,410	470	€450	880	€1,000	€500	1.0	Identified
Cuala GAA Club	Solar PV	2,700		€480	880	€4,500	€2,250	5.0	Identified
Cuala GAA Club	LED Lighting	3,500		€620	881	€3,000	€2,100	3.4	Complete
Dalkey Pharmac	Heat Pump	4,820		€520	1560	€4,000	€2,800	5.4	Identified
Dalkey Pharmac	LED Lighting	3,010		€529	980	€1,980	€1,386	2.6	Identified
Dalkey Pharmac	Solar PV	2,700		€480	880	€4,500	€3,150	6.6	Identified
Harold Boys' Na	Smart Heating Controls		13,760	€690	2820	€7,500	€3,750	5.0	Identified
Harold Boys' Na	LED Lighting	8,180		€1,450	2660	€5,400	€2,700	2.0	Identified
Harold Boys' Na	Solar PV	5,400		€960	1750	€9,000	€4,500	5.0	Identified