# ARKLOW DECARBONISATION ZONE

## Register of Opportunities Report

IE000114Rp0002
Arklow Decarbonisation Zone
D01
13 April 2022

rpsgroup.com

## Document status

| Version | Purpose of document | Authored by | Reviewed by | Approved by | Review date |
|---|---|---|---|---|---|
| D01 | Draft | SR | CB | CB | 13 April 2022 |
| | | | | | |
| | | | | | |

## Approval for issue

Initials.



Prepared by:

**RPS**

Prepared for:

**Wicklow County Council**

# Contents

## Tables



## Figures

# 1 INTRODUCTION

The Register of Opportunities is an important stepping stone to completing the Implementation Plan for the Decarbonisation Zone Implementation Plan in Arklow.
As outlined by Wicklow County Council the rapid implementation of DZ initiatives is required in order to meet the national carbon reduction targets

The register will follow a hierarchy having reference to the Trias Energetica concept:

**Efficiency** (demand reduction) (e.g. retrofitting of buildings to reduce heat energy loss);

**Fossil fuel displacement** (e.g. the transition to electrified transport, community renewable energy projects);
**Efficient use of energy**, in the transition period (e.g. behavioural change programmes, circular economy solutions).

## 1.1 Baseline Emissions Inventory

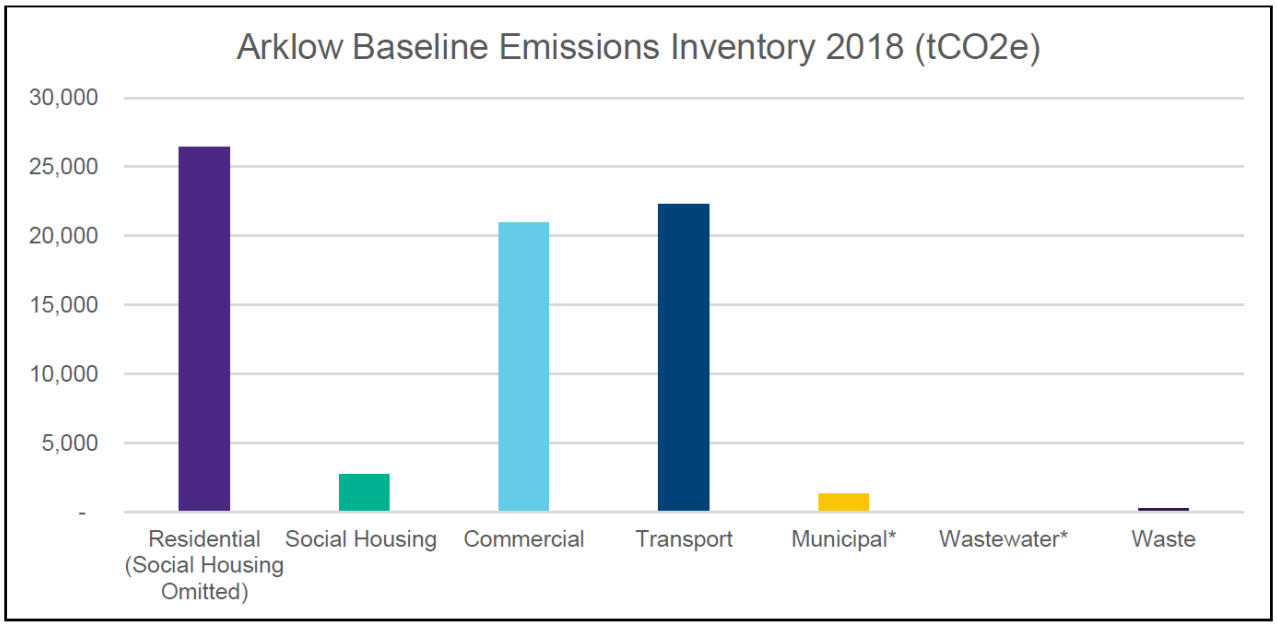


**Figure 1 Arklow Baseline Emissions Inventory 2018**

## 1.2 Approach to Register of Opportunities

Informing the register was a collaboration with the relevant parties within Wicklow County Council. An initial workshop allows stakeholder mapping to identify the key organisations and individuals both within Wicklow County Council and on a broader level across the community.

External stakeholders provided valuable feedback during an information webinar which was held, and subsequently through our follow-up calls with some of the key organisations within Arklow. A number of potential local renewable energy projects were identified.

RPS then assembled a multi-disciplinary team to consider all aspects of the decarbonising opportunities considering energy, transport, spatial planning, place making and biodiversity across the key sectors outlined above in the Baseline emissions inventory.

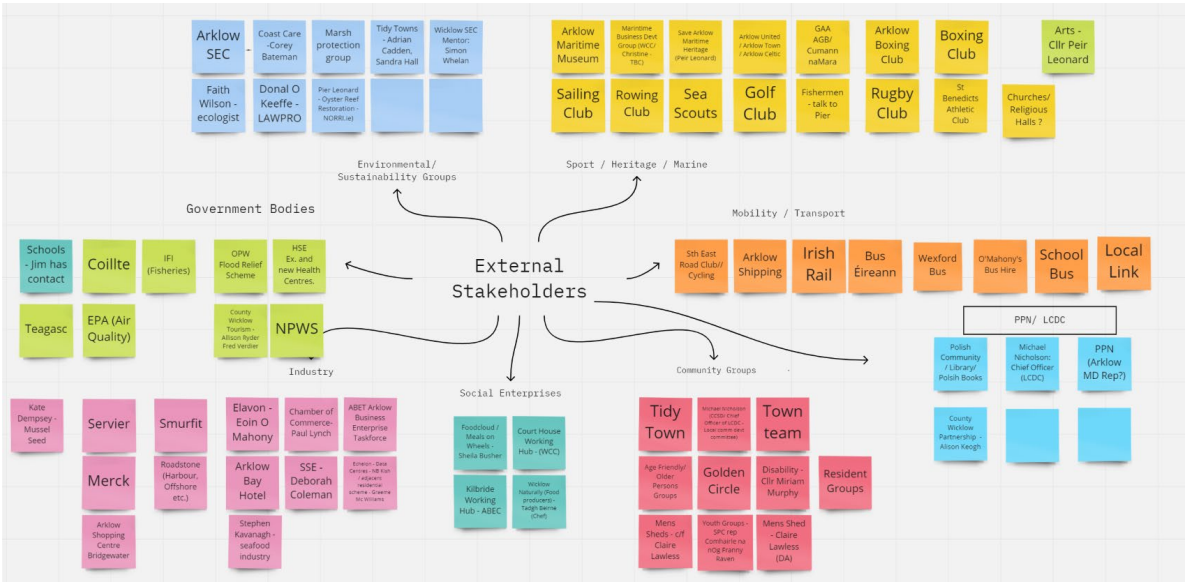


**Figure 2 External Stakeholder Mapping**

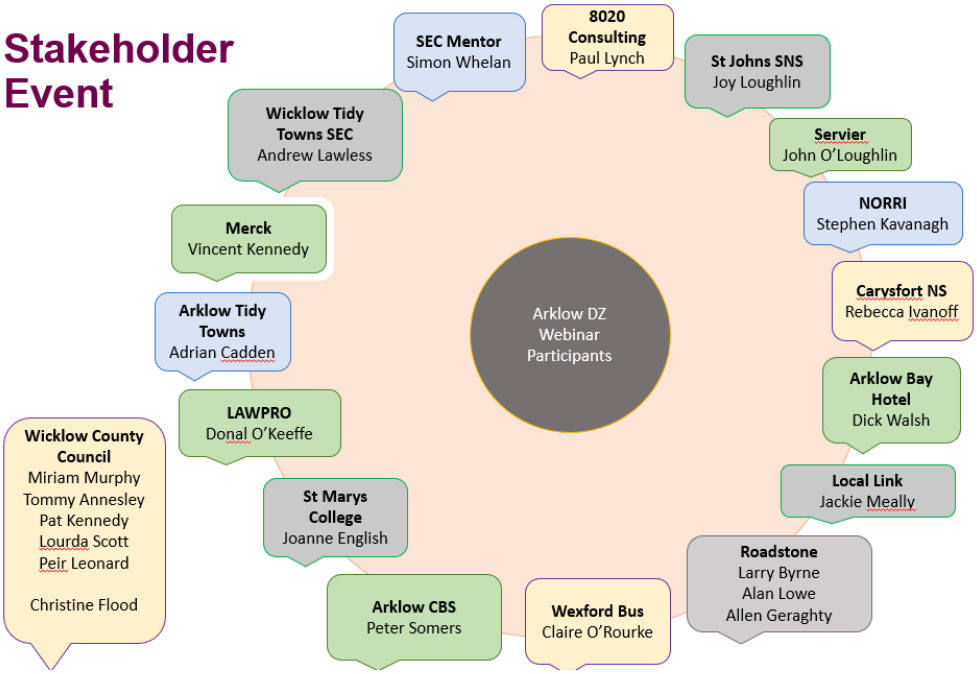


**Figure 3 Arklow DZ Webinar Attendees**

This document will outline the Register of Opportunities including Renewable Energy Potential for the Arklow Decarbonisation Zone following the sectoral breakdown according to the Baseline Emissions Inventory.

# 2 RESIDENTIAL (EXCL. SOCIAL HOUSING)

The baseline carbon footprint of private residential housing in Arklow in 2018 amounted to 26,410 t/$CO_2$eq. These emissions are derived primarily from the use of natural gas, oil and solid fuel for space and water heating, as well as electricity for lighting and home appliances.

There are 5,063 private residential homes in Arklow with an estimated 56% of homes having a BER of C1 or lower. Arklow's residential heating demand map is also illustrated. This map identifies high energy use areas across the town, based on data provided by SEAI.

The breakdown of the residential housing stock in Arklow by BER is illustrated in the table below. BER data is available for County Wicklow as a whole, and this was applied as being equivalent to the housing profile in Arklow town (it is possible that this data might be skewed by newer housing in some northern parts of the county).

**Table 1 BER Profile Arklow 2018**

| BER Rating Range | % |
|---|---|
| A1-A3 | 13% |
| B1-B3 | 11% |
| C1-C3 | 34% |
| D1-D2 | 21% |
| E-G | 21% |

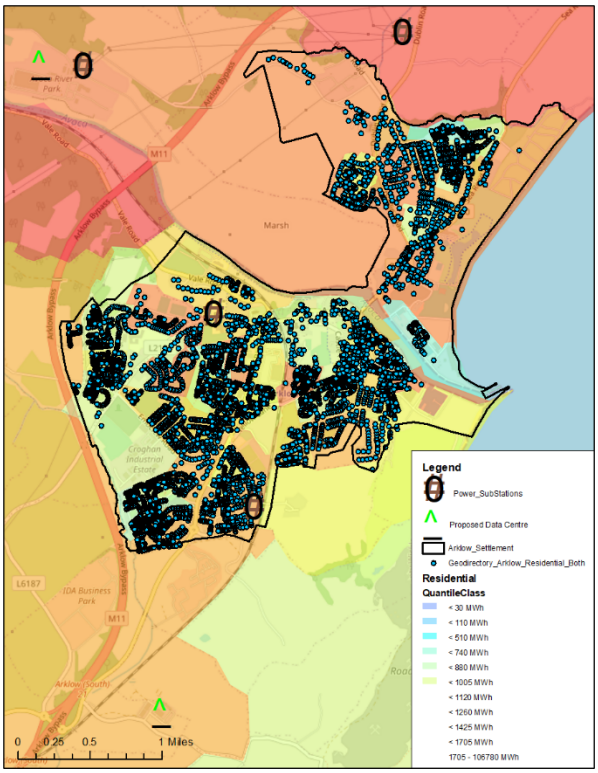


**Figure 4 Arklow Residential Heating Demand (SEAI, 2015)**

The priority action areas within the private residential sector are **energy efficiency** and retrofitting actions as a starting point in line with the 'fabric first' approach from SEAI.

Electrification of heat and **on-site renewable energy** integration, using for the most part Solar PV will follow. Households can also look at installing EV charging points, discussed in the transport section of this document.

**Table 2 Carbon Savings from Private Residential Deep Retrofit**

| **Carbon savings from deep retrofitting all private residential houses in Arklow** | |
|---|---|
| **Goal** | Improve BER grade of all private residential housing in Arklow to at least B2<br><br>– the current average BER grade in Ireland is C2. |
| **Scope/ Description** | Combination of:<br>• Fabric Upgrades (insulation, windows, doors)<br>• New heating systems (typically electric Heat Pump) |

| Carbon savings from deep retrofitting all private residential houses in Arklow | |
|---|---|
| | • Draft proofing, new ventilation systems<br>• Low energy lighting<br>• Upgrade energy control and monitoring |
| **Carbon Reduction in 2030** | Reduction of 17,990 tonnes $CO_2$eq/year compared to 2018 levels (approximately 64% reduction across all houses). |
| **Co-Benefits** | Health benefits from improved air quality due to burning fewer fossil fuels.<br><br>Improved standard of living from increased comfort levels (warmer, less damp, and better ventilation).<br><br>Reduced energy bills. |
| **Responsible** | DECC, SEAI, Department of Housing, Local Government and Heritage, WCC |
| **Cost** | €140.2 million – estimated average retrofit cost is €27,700 per house (ranges from €75,000 for 'G' rated to €10,000 for 'B3' rated). |
| **Funding** | SEAI / DECC – for houses currently at a C2 rating or lower (50%)<br><br>Private funding models |

**Figure 5 Residential Deep Retrofit (Source SEAI)**

# 3 SOCIAL HOUSING

The baseline carbon footprint associated with Social Housing in Arklow was 2,737 t/$CO_2$eq in 2018.

The social housing stock in Arklow includes 508 homes, the majority of which are BER rated C1-C3 at 59%. Comparing **Error! Reference source not found.** with Table 1 (private housing) , it can be seen that the social housing stock in Arklow has already been improved and energy efficiency surpasses the average for private housing.

The BER profile is illustrated in the map and chart below.

**Table 3 BER Profile -Social Housing**

| BER Rating Range | % |
|---|---|
| A1-A3 | 0% |
| B1-B3 | 2% |
| C1-C3 | 59% |
| D1-D2 | 29% |
| E-G | 10% |

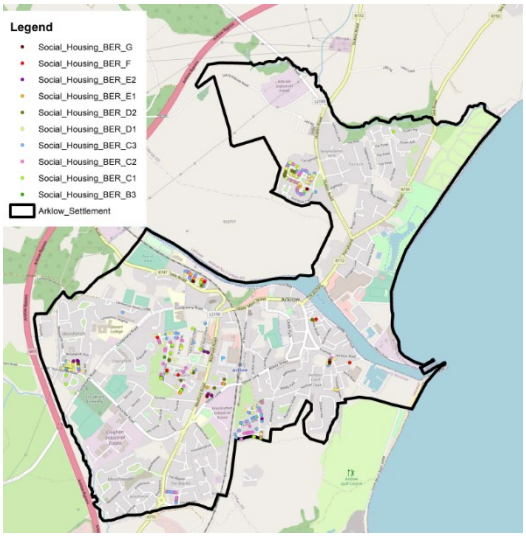


**Figure 6 Arklow Social Housing BER**

As the social housing stock is under the control of Wicklow County Council, this is a sector that could be prioritised for a retrofitting programme. It could then act as a demonstrator for similar private residential homes in the town.

## 3.1 Objective

**Table 4 Carbon Savings from Social Housing Deep Retrofit**

| **Carbon savings from deep retrofitting all social houses in Arklow** | |
|---|---|
| **Goal** | Improve BER grade of all social housing in Arklow to at least B2, to reduce carbon emissions. |
| **Scope/ Description** | Combination of:<br>• Fabric Upgrades (insulation, windows, doors)<br>• New heating systems (typically electric Heat Pump)<br>• Draft proofing, new ventilation systems<br>• Low energy lighting<br>• Upgrade energy control and monitoring |
| **Carbon Reduction in 2030** | -1,443 tonnes $CO_2$eq/year compared to 2018 levels. |

| Carbon savings from deep retrofitting all social houses in Arklow | |
|---|---|
| **Co-Benefits** | Health benefits from improved air quality.<br><br>Improved standard of living from increased comfort levels, due to improved home heating.<br><br>Reduced energy bills. |
| **Responsible** | WCC, SEAI / DECC, Department of Housing, Local Government and Heritage |
| **Cost** | €14.1 million – assuming average cost of €27,700 per house |
| **Funding** | SEAI co-ordinate several programmes for retrofitting. Potential for other creative funding mechanisms. |

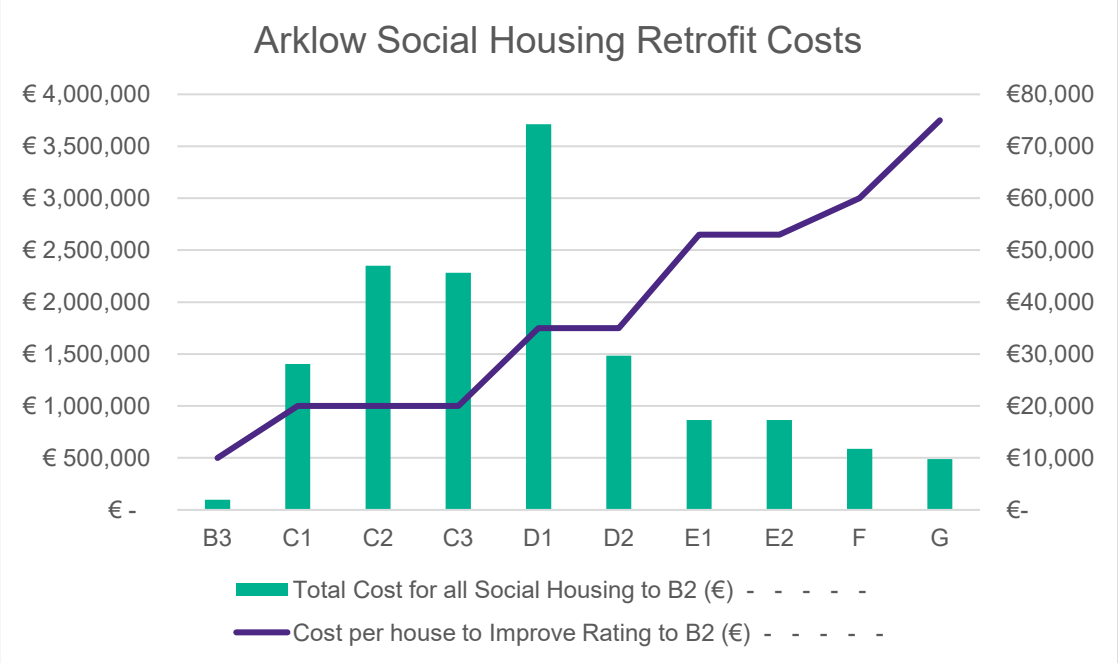


**Figure 7 Arklow Social Housing Retrofit Costs**

# 4 COMMERCIAL

As illustrated by the commercial heating demand map below (based on data provided by SEAI), the commercial profile of Arklow shows some clustering of activity as indicated by the red circles added. There is a cluster of businesses centred around the Main Street and Wexford Road area and continuing to the Ferrybank area of the town including the Bridgewater shopping centre. Additionally, there are several commercial estates on the periphery of the town centre including the Knockrahen and Croghan Industrial Estates to the south of the town centre and the Kilbride industrial estate to the north. There are 522 commercial properties in Arklow (Valuations Office, 2021). The total rateable floor area was used to estimate the carbon footprint from commercial businesses in 2018 – this amounted to almost 21,000 tonnes, or 28.4% of the overall GHG emissions.

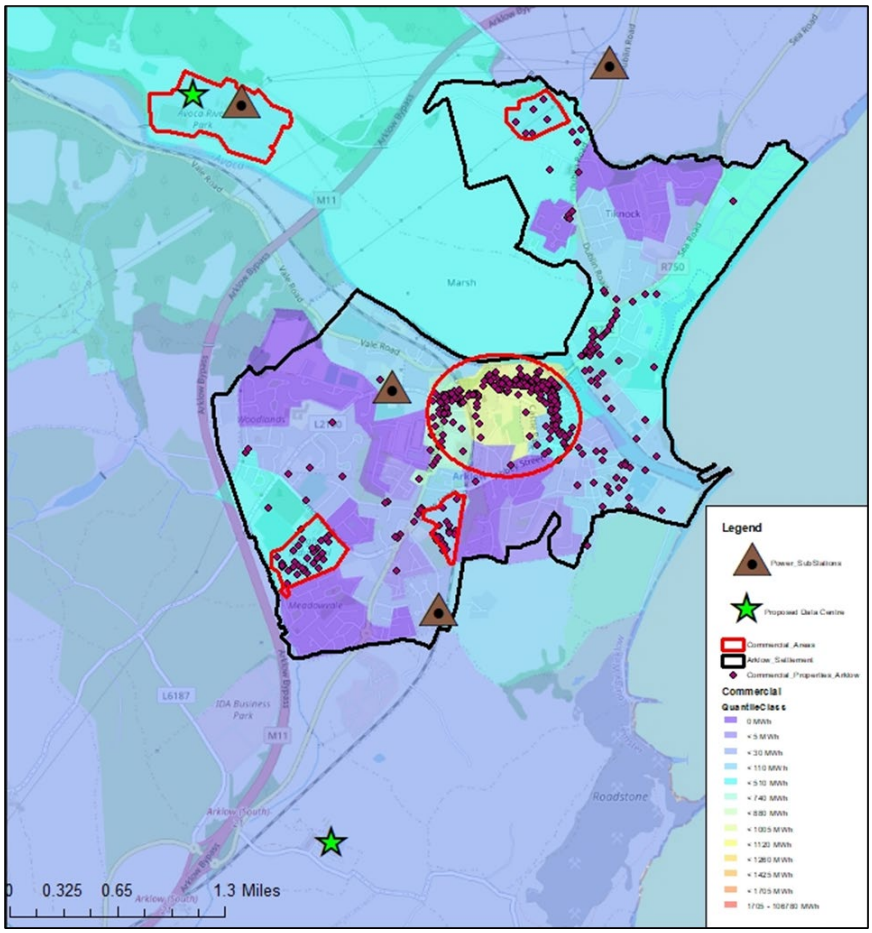


**Figure 8 Commercial Heating Demand (SEAI, 2015)**

Areas of high commercial activity highlighted to illustrate potential areas of co-operation in energy reduction through shared energy systems and infrastructure.

## 4.1 Arklow Business energy efficiency programme

As with the residential sector, the first opportunity for reducing the commercial sector footprint is through energy efficiency. Commercial buildings range from very small shops in older parts of the town to modern warehouses and offices built to modern standards. It is harder to develop an overarching target and cost model for efficiency upgrades. Nevertheless, the approach to efficiency should follow the same process:

- Audit (Understanding the energy consumption)
- Changing practices – zero or low investment investment initiative
- Fabric First – upgrading the thermal efficiency to reduce heat loss and improve comfort levels

- Energy systems upgrade – upgrading heating/ cooling systems and other equipment (e.g. replace gas or oil-fired boilers with heat pumps or biomass boilers).
- Renewable energy sources – look at replace grid electricity with on-site generation

An energy efficiency target of 33% has been set for public sector buildings. Some of Arklow's businesses are already on an energy efficiency journey, but many others are only starting. An energy efficiency target for the town of 30% is considered ambitious but realisable for 2030.

The Arklow SEC can potentially play a role in the management of this programme in line with the objectives of the SEC Energy Master Plan

**Table 5 Arklow Business Energy Efficiency Programme**

| Title | Arklow Business Energy Efficiency Programme |
|---|---|
| **Goal** | Reduce the energy consumption in commercial property by 30% from the 2018 baseline. |
| **Scope/ Description** | Combination of:<br>• Energy auditing<br>• Initial low-cost interventions (e.g. low energy lighting, improved energy controls and monitoring)<br>• Fabric upgrades (insulation, Fabric Upgrades (insulation, windows, doors), maximising natural lighting)<br>• New heating systems and mechanical / electrical upgrades (e.g., biomass boilers, electric Heat Pump, ventilation upgrades, heat exchangers)<br>• Draft proofing, new ventilation systems<br>• Renewable energy systems (e.g., rooftop solar, heat exchange on ventilation) |
| **Carbon Reduction in 2030** | - 6,297 tonnes $CO_2$eq/year |
| **Co-Benefits** | Business efficiency and competitiveness (reduced operational cost).<br>Improved comfort levels for staff and customers.<br>Health benefits due to improved air quality from reduced burning of fossil fuels. |
| **Responsible** | Commercial Businesses, WCC, DECC, SEAI |
| **Cost** | Not Available |
| **Funding** | SEAI /DECC<br>Private funding sources<br>Energy Supply Company options |

**What are the benefits to decarbonising?** (Source SEAI)

Decarbonising is something every business should do. It is also something that more and more businesses want to do. There are many benefits, including:

- Cost savings: most businesses can save up to 10% on their energy bills every year through some basic no- or low-cost actions, with up to 30% savings possible through investments with attractive pay back periods.
- Enhance brand and reputation: many customers now expect companies to have plans for reducing their climate impact and are making purchasing decisions on that basis.
- Increase competitiveness: by preparing your business for a decarbonised world you won't be left behind.
- Attract and retain staff: employees are increasingly looking for their employer to take action around climate change.

## 4.2 Renewable Energy (Solar PV)

The RPS has also identified the potential for a town-wide solar PV programme for commercial properties as a good opportunity for a visible and early intervention as part of the DZ programme. This can be done in

parallel with or independently of other energy efficiency programmes (although good practice is to reduce consumption before focussing on renewable generation).

In order to illustrate the scale of the opportunity, RPS examined the solar energy potential of two of the larger industrial estates in the town (Croghan and Kilbride). Based on available satellite imagery of the area, the facility roof area was estimated, and some basic assumptions of potential available roof area and solar energy yield were applied, enabling an estimate of the renewable energy generation potential. This method is for illustrative purpose, and a more detailed feasibility would be required for each building in order to take account of roof profile, materials, slope etc. These two estates along have the potential to install 2.8 MW of solar PV generation capacity (or an estimated 2.8 GWh of electricity per annum).

### 4.2.1 Croghan Industrial Estate


**Figure 9 Croghan Industrial Estate**

**Table 6 Croghan Industrial Estate Solar PV Potential**

| Building Number | Flat Roof Area (m2) | Area Available for PV Modules (m2) | Potential Intallation (kW) | Cost (€) | Estimated Installed PV annual energy production (MWh) | Company |
|---|---|---|---|---|---|---|
| 1 | 1900 | 950 | 142.5 | € 256,500 | 138.02 | Topline Bolands |
| 2 | 1400 | 700 | 105 | € 189,000 | 101.70 | Pure Fitness Arklow |
| 3 | 800 | 400 | 60 | € 108,000 | 58.12 | John Earls Motors |
| 4 | 1600 | 800 | 120 | € 216,000 | 116.23 | Topline Bolands Hire & Husqvarna Centre |
| 5 | 1000 | 500 | 75 | € 135,000 | 72.64 | Green Treat Ltd |
| 6 | 1000 | 500 | 75 | € 135,000 | 72.64 | Dieterle Tooling GmBH |
| 7 | 2000 | 1000 | 150 | € 270,000 | 145.29 | Fun Works |
| 8 | 1400 | 700 | 105 | € 189,000 | 101.70 | Morgan Doyle |
| 9 | 2000 | 1000 | 150 | € 270,000 | 145.29 | LMH |
| 10 | 580 | 290 | 43.5 | € 78,300 | 42.13 | KDS Joinery Ltd |
| 11 | 990 | 495 | 74.25 | € 133,650 | 71.92 | Blackhorse Tyres |
| 12 | 700 | 350 | 52.5 | € 94,500 | 50.85 | Arklow Bearing Company |
| 13 | 800 | 400 | 60 | € 108,000 | 58.12 | amcor |
| 14 | 450 | 225 | 33.75 | € 60,750 | 32.69 | Arklow Glass & Glazing |
| 15 | 600 | 300 | 45 | € 81,000 | 43.59 | Sign Solutions |
| 16 | 300 | 150 | 22.5 | € 40,500 | 21.79 | LMH Engineering Ltd |
| 17 | 280 | 140 | 21 | € 37,800 | 20.34 | NCT |
| 18 | 790 | 395 | 59.25 | € 106,650 | 57.39 | Repak |
| 19 | 1200 | 600 | 90 | € 162,000 | 87.17 | Paramount Packaging Ltd |
| 20 | 1200 | 600 | 90 | € 162,000 | 87.17 | Arklow Car Parts Ltd |
| 21 | 800 | 400 | 60 | € 108,000 | 58.12 | - |
| 22 | 260 | 130 | 19.5 | € 35,100 | 18.89 | amcor |
| 23 | 1900 | 950 | 142.5 | € 256,500 | 138.02 | P. Boland Ltd |
| **TOTAL** | **23950** | **11975** | **1796.25** | **€ 3,233,250** | **1739.84** | |

## 4.2.2 Kilbride Industrial Estate


**Figure 10 Kilbride Industrial Estate**

**Table 7 Kilbride Industrial Estate Solar PV Potential**

| Building Number | Flat Roof Area (m2) | Potential Intallation (kWp) | | Cost (€) | Estimated Installed PV annual energy production(MWh) | Company |
|---|---|---|---|---|---|---|
| 1 | 1600 | 120 | € | 216,000 | 116.23 | - |
| 2 | 2700 | 202.5 | € | 364,500 | 196.14 | Glenhaven |
| 3 | 3100 | 232.5 | € | 418,500 | 225.20 | Glenhaven |
| 4 | 1500 | 112.5 | € | 202,500 | 108.97 | - |
| 5 | 2150 | 161.25 | € | 290,250 | 156.19 | Tricone Automation |
| 6 | 770 | 57.75 | € | 103,950 | 55.94 | Ed Quip |
| 7 | 1980 | 148.5 | € | 267,300 | 143.84 | Arklow Business Enterprise Centre |
| **TOTAL** | **13800** | **1035** | **€** | **1,863,000** | **1002.49** | |

The total roof area of all commercial buildings in Arklow was estimated using data from the valuations database, and an average available roof space of 30% was applied to estimate the total available roof area for solar panels. A further assumption is that all solar energy generated will be used (either on site, or by feeding into the electricity grid. Where businesses adopt electrical heating systems (e.g., heat pumps) and switch to EV transport fleets, this increases their demand for electricity and works well with solar PV installations. The solar PV for commercial properties in Arklow is summarised below:

**Table 8 Estimated total commercial solar PV potential for Arklow**

| Solar PV Potential Commercial Properties | |
|---|---|
| Average Annual Electrical Energy Production (MWh) | 21,597 |
| Cost of Installation (Million €) | 40 |
| Payback Period based on electricity produced (years) | 10 |
| $CO_2$ Savings (tonnes/yr.) | 4,017 |

**Table 9 Commercial Rooftop Solar Potential**

| **Title** | Installation of rooftop solar PV modules on commercial properties (500+ buildings) in Arklow |
|---|---|
| **Goal** | Install solar PV modules to all commercial premises in Arklow to reduce reliance on grid electricity, to reduce carbon emission associated with electricity use. |
| **Scope/ Description** | Combination of:<br>• Installing solar PV modules on the rooftops of commercial premises.<br>• Powering the commercial properties with maximum amount of solar energy available.<br>• Selling excess electricity to electrical grid, if there is an excess amount generated, to ensure all electricity generated is used. |
| **Carbon Reduction in 2030** | - 4,017 tonnes $CO_2$eq/year (based on estimated carbon emissions of electricity generated in 2030 (conservative approach).) |
| **Co-Benefits** | Reduced use of grid electricity which contains fossil fuels.<br>Health benefits due to improved air quality from reduced burning of fossil fuels.<br>Cheaper electricity cost over lifespan of PV modules. |
| **Responsible** | Commercial Businesses, WCC, DECC, SEAI |
| **Cost** | €40.14 Million |
| **Funding** | SEAI<br>DECC<br>Private funding sources (Energy Supply Company model, or other). |

# 5 TRANSPORT

The Sustainable Accessibility and Mobility (SAM) Framework is an approach calls for measures that first focus on the role of place in reducing trips, before considering how to increase the proportion of the remaining trips that are taken by active, public, and shared forms of transport.

The next step in addressing the transport carbon footprint is to reduce reliance on motorised vehicles, by achieving a switch to active travel (walking, cycling). Following that, using public transport can result in much more carbon-efficient journeys, and at the same time reduce congestion in the town.

Then transport emissions for the remaining cars and freight vehicles can be reduced by switching away from fossil fuels towards low-emission vehicles such as Electric Vehicles and other technologies such as biofuels and hydrogen.

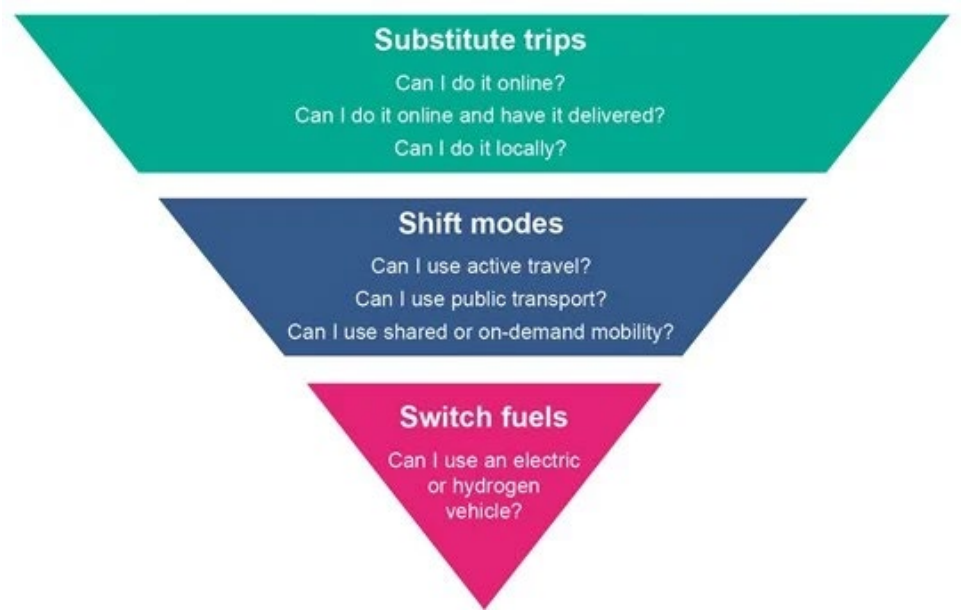


**Figure 11 Sustainable Accessibility and Mobility (SAM) Framework**

## 5.1 Active Travel

Following the SAM framework will enable the development of a 15-minute town plan for Arklow .As outlined in the *Placemaking and Active Travel Plan*, the '15-minute neighbourhood' (sometimes referred to as the 15-minute city or the 20-minute town) is one of the foundations upon which net zero transport networks can be built. The defining characteristic of the '15-minute neighbourhood' is that people can live locally and meet most of their daily needs within a 15-minute walk or cycle from their home.

The morphology and size of Arklow is such that the town centre and all the facilities located there are within a 15-minute cycle from all parts of the town. A significant portion of the population lives within a 15-minute walk of the town centre. The active travel proposals include an enhanced, connected network of cycling infrastructure throughout Arklow to aid the shift to bicycles. Safe route to School is an important feature of this to enable the schools' communities to increase the share of trips made by cycling. Other actions include the provision of additional bicycle parking facilities, improvement of directional signage and the provision of public bicycle repair/maintenance stations.

Walking infrastructure is also an important feature of the active plan, with improved pedestrian experience prioritised as well as an improvement in pedestrian connections through some of the main streets and surrounding areas.

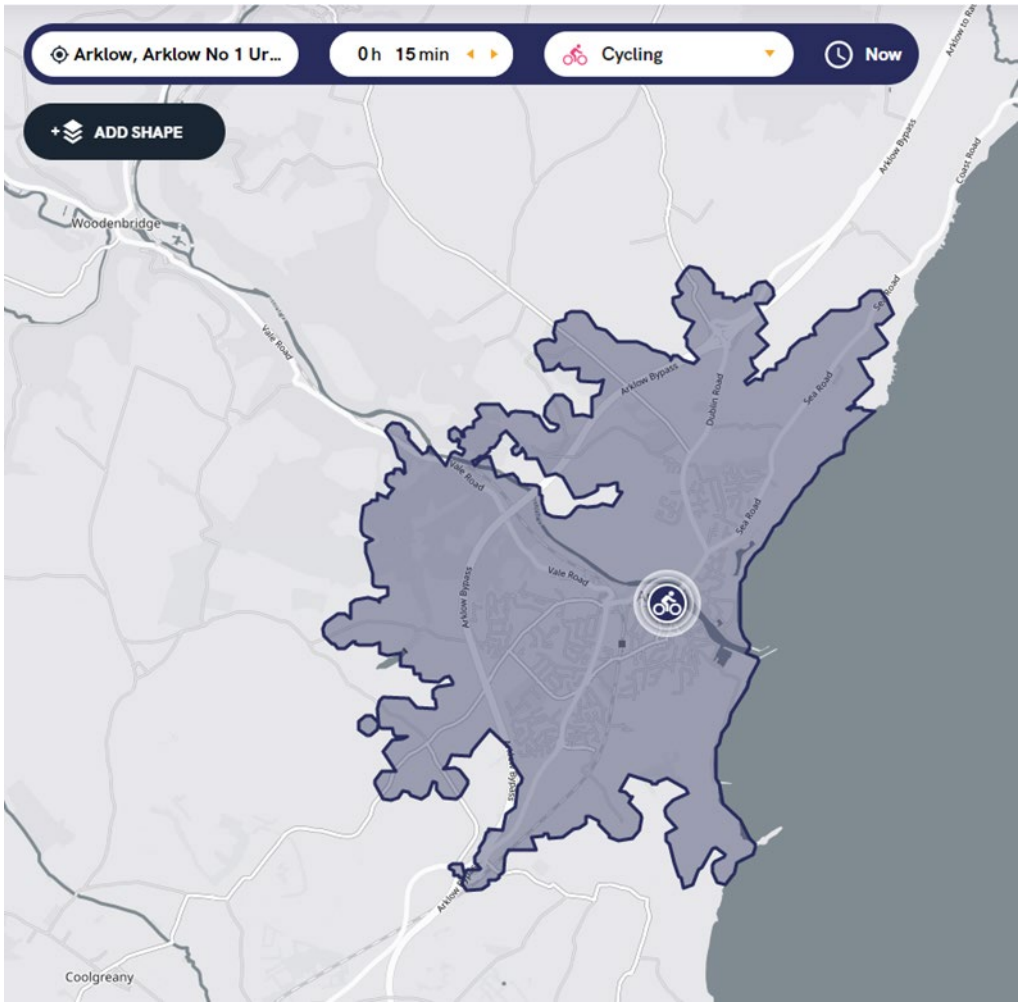


**Figure 12 15-minute cycling isochrone Arklow**

**Table 10 Modal Shift to Active Travel and Public Transport**

| Title | Modal Shift to Active Travel and Public Transport |
|---|---|
| **Goal** | Targets: reduce overall transport emissions by 10% from 2018 baseline through Active travel and public transport. Adopting an Arklow 15-minute town concept. |
| **Scope/ Description** | • Schools' morning and evening drop off (switch to active travel modes). A specific Active Travel Targets of 30% to school by active travel by 2025 in proposed.<br>• Workplace commuting in Arklow – a switch to walking, cycling and E-bikes, and car-pooling for workers in the town's businesses. This can be driven by Workplace travel plans and programmes.<br>• Co-working spaces to be made available in the town<br>• Day-to-day trips in the town – with enhanced amenities and pedestrian and cyclist facilities, more journeys for shopping and other short trips can be done by active travel.<br>• Innovation such as a bike, e-bike and e-scooter share scheme to stimulate active travel growth.<br>• Behavioural Change…Substitute trips for those able to work from home encourage local digital hubs to act as a central point for those working from home… (expand as per above)<br>• Public realm streetscape re-allocation (including bicycle parking etc.)<br>• Micro-consolidation for council services and low-carbon logistics |
| **Carbon Reduction in 2030** | 2,229 tonnes |

| Title | Modal Shift to Active Travel and Public Transport |
|---|---|
| | Safer healthier town with greater shared public spaces. Cleaner air, less congestion, and a more commercially vibrant town centre. |
| **Responsible** | WCC, NTA, Schools, DHLGH, Arklow businesses. |
| **Cost** | € Not available (will combine Active Travel facilities with behavioural change programmes) |
| **Funding** | NTA, DHLGH (URDF), WCC, Private/ Corporate funding. |

The active travel plan combines active travel with urban design and placemaking to reconfigure the town and deliver the 15-minute neighbourhood concept.

Urban design features should include car-free zone, controlled parking zones, the re-allocation of streetscapes for recreational purposes as well as active travel and combined with an enhanced public transport system can see the required reduction of transport emissions.

Key place making projects identified include:

- Reimagining of St. Mary's Park and the Bandstand Car Park
- Harbour Area
- New Pedestrian / Cyclist Bridge

## 5.2 Opportunities for Public Transport in Arklow

Potential Opportunities for Public Transport have been explored in the separate *Placemaking and Active Travel Plan* and include opportunities such as:

- Increase frequency of rail services.
- Increase range and frequency of local services.
- On demand / responsive public transport services / taxi services within the town; and
- Enhanced linkages with Wexford Bus Services

## 5.3 Electric Vehicle Transition

### 5.3.1 Transformation of private vehicle fleet to EVs

National policy in the Climate Action Plan 2021 is to rapidly transform the national private car fleet from fossil fuels (petrol, diesel) to electric vehicles (EVs). By 2030, it is intended that there will be close to 1 million electric vehicles on Irish road. Hybrid cars are expected to form part of the transition, but government supports are now favouring fully electric 'plug-in' vehicles. This makes sense given the rapid decarbonisation planned for the electricity grid.

Supports available from SEAI include a grant of €5,000 on new BEV's costing more than €14,000.

This changeover is in the hands of individual car owner. As well as purchasing an EV, installation of charging points is required at household level. This might be combined with other 'energy retrofit' measures (for example solar PV panels, and battery storage) in the 'residential' sector above. SEAI offer additional funding for EV charging points at home to 70% of the cost of installation or about €600 per charging point.

The following chart shows the dramatic effect that EVs can play in reducing Arklow's carbon footprint. This graph shows a successful embrace of national policy in Arklow, with 90% of cars being EV's by 2030 (80% BEV & 10% Hybrid).

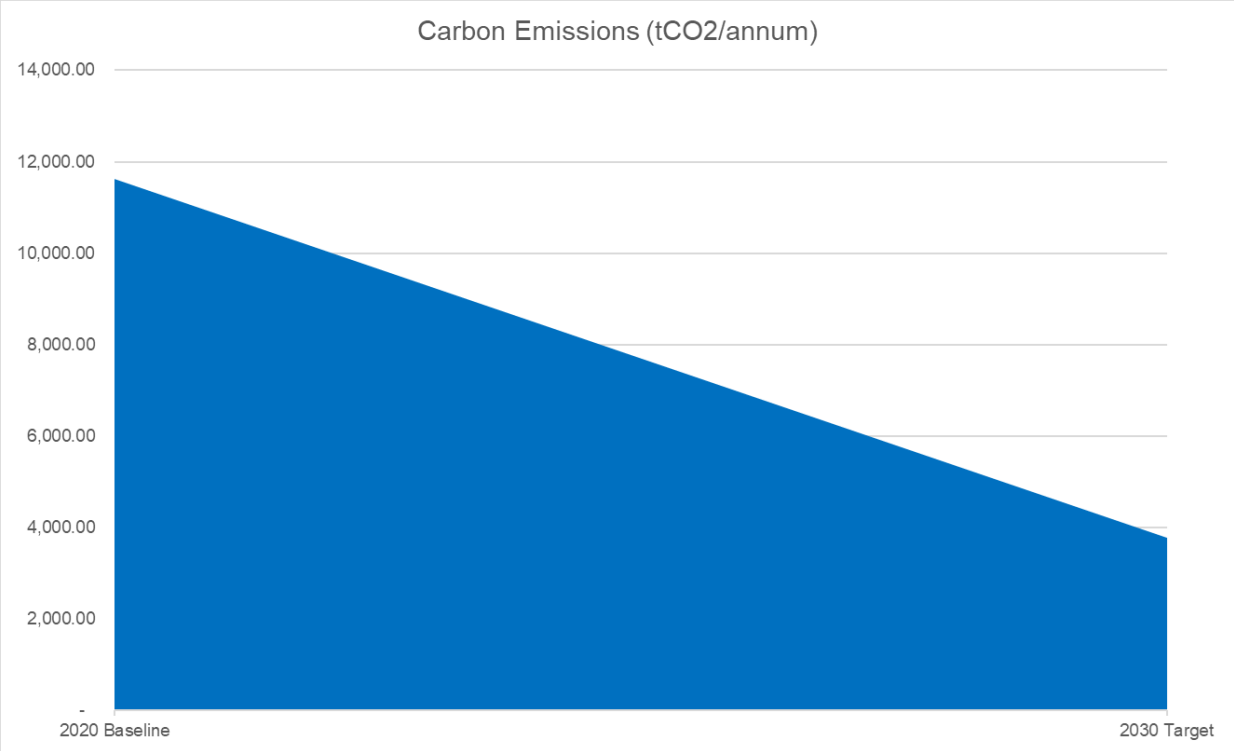


**Figure 13 E-Vehicle Transition**

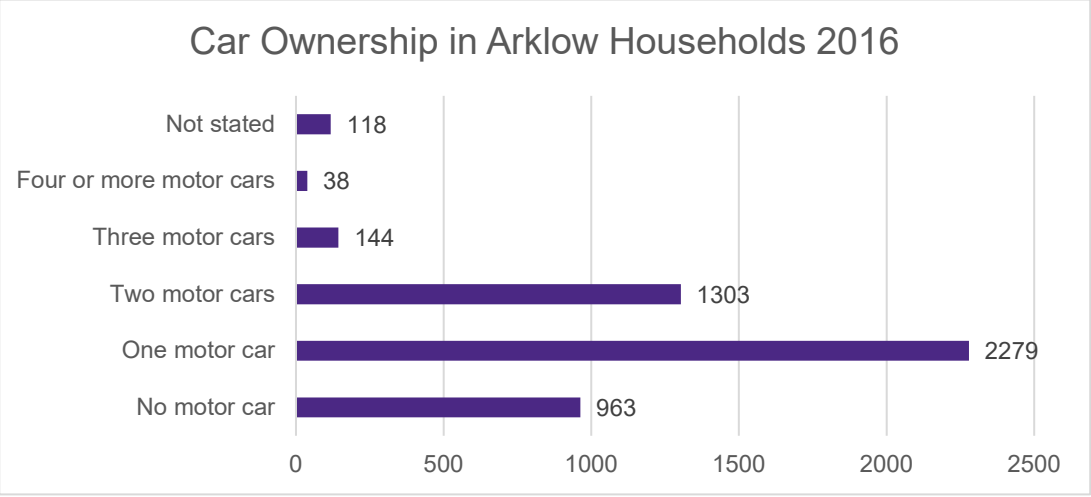


**Figure 14 Car Ownership in Arklow Households 2016**

Current patterns of car ownership in Arklow are set out in Figure 14 and total fleet is estimated to be 5,500 cars in 2016 (CSO).

**Table 11 E-Vehicle Transition – Arklow Private Fleet**

| Title | Transformation of private car fleet in Arklow to EVs |
|---|---|
| **Goal** | 90% EV fleet by 2030 |
| **Scope/ Description** | • 4,900 EVs<br>• 3,400 EV charging point installations (households) |
| **Carbon Reduction in 2030** | - 7,856.17 t/$CO_2$eq |
| **Co-Benefits** | Reduction in air pollution associated with tailpipe emissions in cars.<br>Reduction in noise pollution |

| Title | Transformation of private car fleet in Arklow to EVs |
|---|---|
| | Reduced risk of refuelling leaks and spills (improved water quality). |
| **Responsible** | Householders, WCC, SEAI, DECC |
| **Cost** | €127 million (based on estimated EV price of €37,500 based (ref. Kia Soul) incl. SEAI grant and VRT reduction) |
| **Funding** | Private funding (householders), DECC/SEAI |

### 5.3.2 EV Public Charging Infrastructure

Most EV charging is expected to be done at the place of residence, but public EV charging points will be needed to support the transition, for example to enable flexibility for car owners and to serve visitors to the town, or those making longer journeys.

This is discussed in more detail in the *Placemaking and Active Travel Plan*.

**Figure 15 E-Vehicle Charging Station**

# 6 MUNICIPAL

An assessment of the energy consumption hotspots taken from the Arklow data of the SEAI M&R system demonstrated that the Coral Leisure centre swimming pool and gym is among the largest consumers of energy in the town. Additionally, the Civic Offices and the Croghan recycling centre are also significant consumers of electricity.

**Table 12 Overview of energy consumption in WCC facilities (2018)**

| | Unit | 2018 |
|---|---|---|
| **Electricity** | | |
| Coral Sports Swimming Pool Arklow | kWh | 165,735 |
| Civic Offices & Library, Main Street, Arklow | kWh | 56,300 |
| Croghan Industrial Estate Emoclew Arklow Recycling Centre | kWh | 51,560 |
| Coral Leisure Sports Centre Arklow | kWh | 30,959 |
| Harbour Office South Quay Arklow | kWh | 22,710 |
| Fire Station Arklow | kWh | 18,150 |
| **Gas** | | |
| Coral Sports Centre Arklow | kWh (Gross) | 170,172 |
| Coral Leisure Swimming Pool Arklow | kWh (Gross) | 834,589 |

## 6.1 Coral Leisure Centre - Swimming Pool and Gym

As well as the meter reporting through the SEAI M&R system, baseline emissions reporting has been carried out by the Coral Leisure Centre through Ecomerit since 2016. Furthermore, a 2018 energy audit of the leisure centre was carried out by the 3 counties energy agency(3CEA).

The Leisure centre is the primary consumer of gas from a municipal perspective with 83% of the total being used in the heating of the pool. The leisure centre implemented a range of energy efficiency and renewable energy measures in 2016 through the SEAI Better Energy Communities. These measures included: LED lighting indoors and outside pool and gym, energy saving reducers on hot taps and shower heads, 18.72 kWp Solar PV panels on gym roof and solar film on south and west windows.

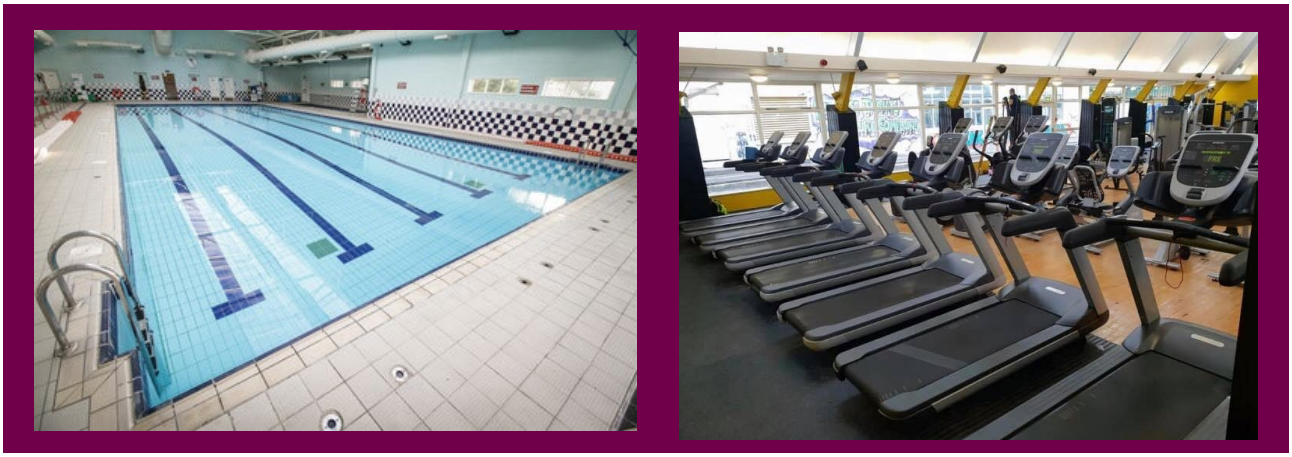

**Figure 16 Coral Leisure Centre Swimming Pool and Gym**

There is a possibility of further reductions in dependency on fossil fuels within the Coral Leisure Centre Complex. The leisure centre management have initiated the application process for an EXCEED grant from the SEAI for the installation of an additional PV system on the swimming pool roof and for additional insulation of the swimming pool. Consideration should also be given to the installation of a solar carport in the carpark. This could also form part of an e-vehicle charging station.

## 6.2 Municipal Buildings

There have been upgrades on the municipal buildings in Arklow however there is still an opportunity for additional gains to be made under the public sector energy efficiency programme.


**Figure 17 Arklow Fire Station and Civic Buildings**

## 6.3 Municipal Transport Fleet

Wicklow County Council Arklow municipal district is operated from the town. A fleet of operational vehicles including vans, pick-up tricks, and other utility vehicles is used to operate and maintain municipal services such as housing, litter collection, and parks maintenance.

The is an opportunity to transition the municipal fleet to E-vehicles to reduce associated emissions. Some preparatory work has been completed at the municipal depot in Arklow to enable EV charging.

Current Arklow Fleet Details are as follows:

**Table 13 Arklow Municipal Fleet**

| Vehicle Type | Total Annual Mileage (Km) | Total Annual $CO_2$eq Emissions 2022 (tonnes) |
|---|---|---|
| Trucks (6) | 91,800 | 30 |
| SUVs (6) | 58,100 | 9 |
| Vans (3) | 40,000 | 8 |
| Pick-Ups (2) | 37,000 | 8 |
| | | **55** |

Source: WCC – No data on cars in use

Good case studies for consideration include Cork County Council and Dun Laoghaire Rathdown Council where a fully electric Municipal Fleet will be in place by 2030.


**Figure 18 Electric Vehicles in Dun Laoghaire Rathdown and Cork County Councils**

## 6.4 Public Lighting

Across Ireland upgrading of public lighting is underway. Older lamps (sodium) are being replaced with LED lamps, which are much more energy efficient and create less light pollution. Wicklow County Council is co-ordinating the lighting retrofit across the County.

Arklow's public lighting will be upgraded under this programme. Table 14 below sets out the anticipated carbon reduction that will be achieved.

Some new technologies are becoming available to enable 'dimming' of lights (reduced lighting when streets are empty, or at certain times of the night). Innovation with modern lighting controls has the potential to further reduce energy use and carbon emissions. Arklow would be a good location to develop some innovation trials.

**Table 14 Public Lighting Energy Efficiency Improvements**

| Title | Improve energy efficiency of public lighting in Arklow |
|---|---|
| **Goal** | Retrofit public lighting in Arklow (approx. 1000 streetlights) to help local authority reach energy efficiency goal of 50% by 2030. |
| **Scope/ Description** | Replace low-pressure sodium and high-pressure sodium streetlamps with LED bulbs. |
| **Carbon Reduction in 2030** | -110.7 tonnes $CO_2$eq/yr. |
| **Co-Benefits** | Better quality lighting – enhanced amenity.<br>Reduced light pollution.<br>Annual financial savings from more efficient energy use. |
| **Responsible** | Wicklow County Council, Road Management Office |
| **Cost** | €500k |

| Title | Improve energy efficiency of public lighting in Arklow |
|---|---|
| **Funding** | Wicklow County Council (90%)<br><br>Climate Action Fund (10%) |

## 6.5 Arklow Schools

Based on stakeholder feedback and a review of opportunities for citizen engagement, a focus on the schools in Arklow is seen as an excellent way to prioritise climate action. As well as the transport related goals set out above, a focus on decarbonising the schools' buildings has potential to raise awareness as well as reducing emissions.

At this stage, we have examined the potential for an early implementation of solar PV rooftop renewable energy, with all Arklow's schools grouped together. The potential to group the schools and avail of an economy of scale can be explored.

The total roof area of all school buildings in Arklow was estimated using data from satellite imagery, and an estimate of available roof space was used to estimate the total available roof area for solar panels. A further assumption is that all solar energy generated will be used (either on site, or by feeding into the electricity grid. This method is for illustrative purpose, and a more detailed feasibility would be required for each building to take account of roof profile, materials, slope etc.

The Department of Education and SEAI have collaborated on a 'Pathfinder' project whereby a number of schools have carried out extensive retrofitting to improve energy performance. Replicating this will be a longer-term goal for the Arklow DZ.

**Table 15 Solar PV Potential – Arklow Schools**

| Schools | Installation of rooftop solar PV modules on school buildings (10 buildings) in Arklow to reduce use of grid electricity. |
|---|---|
| **Goal** | Install solar PV modules to all schools in Arklow to reduce reliance on grid electricity, which contains fossil fuels, to reduce carbon emission associated with electricity use. |
| **Scope/ Description** | Combination of:<br>• Installing solar PV modules on the rooftops of school buildings.<br>• Powering the schools with maximum amount of solar energy available, that is generated by the modules.<br>• Selling excess electricity to electrical grid, if there is an excess amount generated, to ensure all electricity generated is used. |
| **Carbon Reduction in 2030** | - 336.15 tonnes $CO_2$eq/year based on estimated carbon emissions of electricity generated in 2030. |
| **Co-Benefits** | Reduced use of grid electricity which contains fossil fuels.<br><br>Health benefits due to improved air quality from reduced burning of fossil fuels.<br><br>Reduced pressure on electrical grid demand.<br><br>Cheaper electricity cost over lifespan of PV modules. |

| | |
|---|---|
| **Schools** | **Installation of rooftop solar PV modules on school buildings (10 buildings) in Arklow to reduce use of grid electricity.** |
| | Awareness and participation bonus for the town. |
| **Responsible** | DECC, SEAI, Department of Education |
| **Cost** | €1.4 Million |
| **Funding** | SEAI, DECC, Department of Education, Wicklow County Council. Potential for private (corporate) sponsorship. Potential for energy Supply Company model. |

**Table 16 Total Rooftop Area Arklow Schools**

| School | Rooftop Area ($m^2$) |
|---|---|
| St. Joseph's National School | 3000 |
| Gaelcholaiste na Mara | 1780 |
| St. John's Senior National School | 1780 |
| Arklow CBS Secondary School | 2700 |
| Glenart College | 4300 |
| Gaelscoil an Inbhir Mhoir | 580 |
| St. Mary's College | 1400 |
| SS Michael and Peter Junior School | 230 |
| Arklow Further Education and Training | 550 |
| Carysfort National School | 1450 |

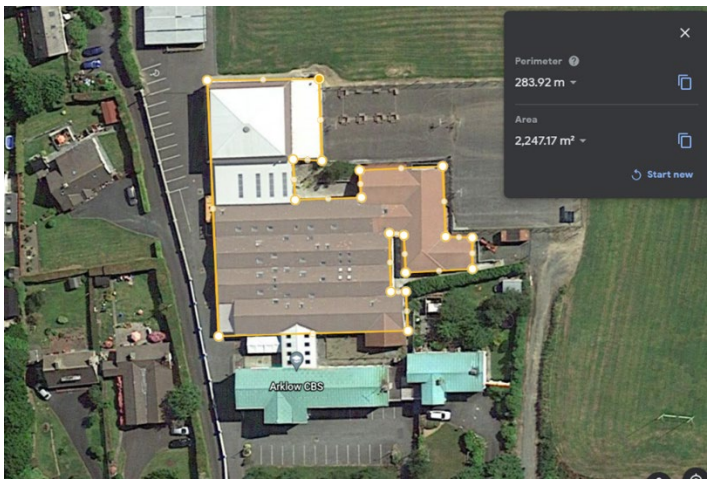


**Figure 19 Arklow CBS Rooftop Solar PV Potential**

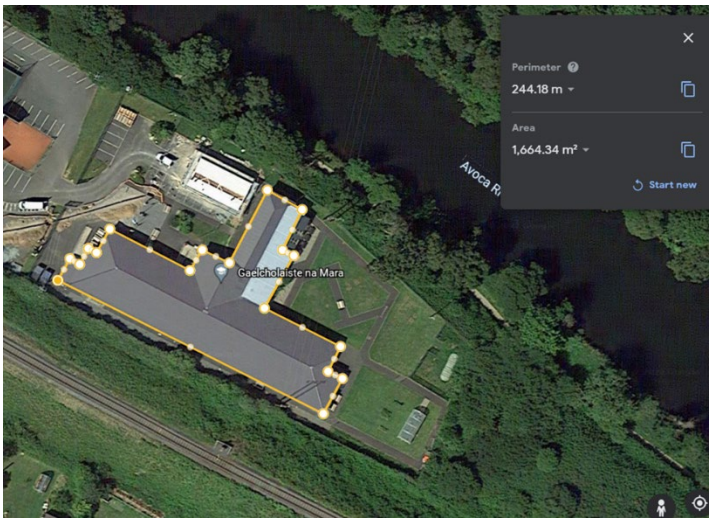


**Figure 20 Gaelcholaiste na Mara Solar PV Potential**

## 6.6 Decarbonisation of other Public Sector Buildings and Activities

To be completed once carbon footprint data has been established from M&R enquiry. This will reflect the energy efficiency and decarbonisation goals for all government bodies. Potential to create a network in Arklow for collaboration/ sharing between public sector organisations.

# 7 CIRCULAR ECONOMY

## 7.1 What is the Circular Economy and how can it help reduce Arklow's carbon footprint?

The circular economy offers an alternative to the common approach of 'take-make-waste' that dominates in today's highly consumerised society. In the circular economy model, we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of life.

As identified in the 'Whole of Government Circular economy strategy 2022-2023, increasing extraction of natural resources and disposal of waste is a major contributor to habitat and biodiversity loss and contributes to global warming. Half of total greenhouse gas (GHG) emissions and more than 90% of biodiversity loss and water stress come from resource extraction and processing. Therefore, achieving a circular economy will play an important part in reducing global carbon impact and protecting natural resources, environment and health.

As can be seen in Figure 21 below, there is still approximately 1,800 tonnes of household waste being treated by landfill and incineration from the Arkow DZ area every year. By reducing this waste, and commericial waste streams, Arklow's carbon footprint will be directly reduced. There will be wider and indirect reduction in GHG emissions at national and international level as towns like Arklow lead the way in implementing new circular economy models.

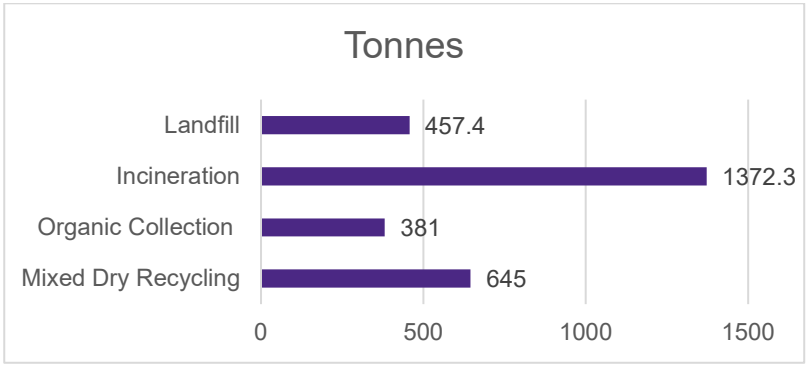


**Figure 21 Arklow Household Waste 2018**

## 7.2 Circular Economy Opportunities in Arklow DZ

There are significant opportunities for circular economy principles to be mainstreamed within Arklow, by incorporating reuse, repair and recycle principles across the community and commercial space. This offers opportunities for businesses and community groups to get involved with local initiatives.

WCC have can partner with local charity shops and waste and recycling agencies to implement behaviour change campaigns and support the promotion of the circular economy in Arklow to reduce the rates of waste going to landfill and incineration.


**Figure 22 examples of public engagement from the EU Green Capitals and Green Leaf Programme.**

Raising awareness and encouraging participation in the circular economy is essential. WCC as the lead in the DZ implementation can help kick start initiatives such as

- Organise workshops for repair skills for textiles, furniture and promote a new approach to reuse
- Develop training in bicycle repair and upcycling to encourage circular patterns of use
- Launching circular economy promotions, ofr example using the public library (and other municipal buildings) for promotional events, displays, seminars and workshops
- Kickstarting 'Boot Sale'/ 'Bring and Buy Sales' to encourage behavioural change and focus on re-use of second-hand products
- Partnering with local business in a specific sector to highlight how the circular economy is working for them.
- Engaging schools in programmes such as uniform exchange days.
- Developing competitons and other novel initiatives to stimulate interest and participation.

## 7.3 Reuse, Repair and Exchange

Opportunities:

- Upgrade civic amenity recycling centre to a re-use **Circular Economy Hub**. This will focus on capturing more materials for reuse, repair and upcycling, and at the same time developing a customer base and stimulating demand for reused products such as furnitures, electronic equipment, sporting equipment.
- Promote **person to person reuse and exchange** of materials. This already happens with online trading platforms such as Adverts.ie and on Facebook Marketplace. The DZ initiative can help grow the second-hand marketplace and make it mainstream.
- Work with Chamber of Commerce to encourage local business to develop **resource exchange** relationships. Smart businesses will minimise waste generation and will try to collaborate with other narby businesses to exchange resources such as waste heat, organis waste, surplus raw materials etc. By connecting businesses in the town, and encouraging cross fertilisation, the DZ initiative can encourage circular economy solutions between organisations.

## 7.4 Engaging with the Social Economy

Already the social economy has engaged in recycling and circular economy solutions for a number of decades – for example the charity shops, textile recyclers and the glass recycling sectors. There is room for greater collaboration between WCC and the social economy to expand and improve existing efforts and to develop new solutions.

## 7.5 New attitudes to Food and Food Waste

Reducing food waste supports decarbonisation at a global level (less wasted resources and emissions) and at a local level (less waste for collection and treatment).

An estimated 381 tonnes of household organic waste were collected in Arklow in 2018. There is no data available on Arklow's commercial food waste produced by restaurants, cafes, and supermarkets, however according to the EPA National Waste Prevention Programme 19% of food waste in Ireland in 2018 was attributed to this sector and 24% to household food waste.

- **Foodcloud** is already working with businesses such as McDonalds, Tesco, and Lidl in Arklow, but there is still scope for an increase in the distribution of unused food from commercial business to local social enterprises and charities.
- By improving peoples appreciation of how food is grown, peoples attitude to food waste can improve. At present, Arklow does not have an Allotment, which can act as a focal point for the community and kick start new attitudes to food, land use and food waste. By enabling **the development of an allotment, and encouraging the Grow-Your-Own (GYO) movement** to expand in Arklow, this can indirectly reduce the town's carbon footprint.

**Figure 23 Allotments and Farmers Markets can encourage a new relationship to food and food waste**

(Pic: Shannon Allotments, County Clare, and The Courtyard Market, Boyle, Co.Roscommon).

## 7.6 Textiles

Arklow is one of three towns nationally participating in a CRNI pilot project on Circular Textiles. The 'Donate Don't Waste' programme aims to embed best practice in textiles reuse in Arklow. This demonstrator pilot project, one of three in Ireland is launching in Arklow in 2022 and offers the town an opportunity to be a leader in circular textiles in Ireland.

Further events and programmes to encourage responsible approaches to fashion and textiles can from part of the circular economy solutions for the DZ area.

**Table 7 Circular Economy Programme for Arklow DZ**

| Circular Economy Programme | Planning and developing awareness measures, initiatives, projects and facilities to support a transition to more circular solutions for the resources used in Arklow |
|---|---|
| **Goal** | Reduce reliance on 'take-make-waste' processes for households, communities and businesses. Reduce waste generation and treatment (and associated carbon emissions) |
| **Scope/ Description** | Combination of:<br>• Public awareness programmes<br>• Engagement and promotion events for community and business<br>• Development of reuse and repair hub<br>• Special programmes and initiatives in sectors such as textiles and food<br>• Allotments and Grow it Yourself initiatives. |
| **Carbon Reduction in 2030** | -64 tonnes tonnes $CO_2$eq/year (target 25% reduction in waste carbon footprint 2018) |
| **Co-Benefits** | Employment creation by means of circular economy solutions.<br>Reduced use of natural resources (raw materials, transport, etc.)<br>Reduced food waste.<br>Awareness and participation bonus for the town. |
| **Responsible** | WCC, DECC, Community and Business, Social economy sector (charity shops, etc.) |
| **Cost** | €*** TBD |
| **Funding** | DECC (Circular Economy Fund), EPA, Potential for private (corporate) sponsorship. |

# 8 CARBON SEQUESTRATION OPPORTUNITIES AND ENHANCING THE NATURAL CAPITAL OF ARKLOW

As well as finding ways to reduce emissions, climate action can also include finding ways to remove carbon dioxide from the atmosphere. This can be achieved by natural methods such as growing trees, creating (or restoring) active peatlands, and regenerative farming practices, all of which can sequester carbon from the atmosphere and lock it away naturally. A number of options to contribute to carbon sequestration in Arklow have been examined, including tree planting, coastal action, and exploring wider scale opportunities in the catchment of the Avoca River.

## 8.1 Opportunities in the Town – Tree Planting and Biodiversity Enhancement

The decarbonisation plan for Arklow will combine regeneration efforts, upgrading of the public realm, and enhancement of local amenities to support an active and attractive town ambiance. Additional tree planting can contribute to this overall public realm upgrade, and at the same time make a contribution to the reduction in GHG emissions. Tree planting can also help reduce heat-island effects and keep temperature down in summer periods. Quantifying carbon sequestration from on-street tree planting is challenging until the exact location and extent of tree planting is known.

The DZ boundary is close to the developed areas of the town, and there is limited potential for large scale woodland planting. However, there are several brownfield sites within or close to the DZ boundary – for example the former IFI industrial plant, tailings area at Shelton Abbey, and other smaller pockets of previously developed land – and these may provide opportunities for developing trees and other biodiversity enhancement.

A further way to develop more carbon sequestration is to promote biodiversity enhancement in new development in the town. The local area plan and the development management system (planning permissions) can set a requirement for a 'net gain' in biodiversity in all new developments. This is already a stipulation for new development in England (above a certain threshold of scale). Arklow could set a similar policy.

One way to bring together opportunities for more carbon sequestration, more biodiversity and improvement of natural amenities in the town is to develop a **Green Infrastructure Plan** for the town. This will involve a closer look at the strengths and weaknesses of the current distribution of parks, green corridors, and woodlands. The public can engage in mapping existing natural areas and identifying opportunities for improvement. Carbon sequestration benefits – and co-benefits for health, amenity, recreation - can then be identified.

## 8.2 Coastal Action

The Native Oyster Reef Restoration Ireland (NORRI) Project is working to restore the oyster reefs off the coast of Arklow. The restoration of these habitats will improve water quality to help marine vegetation like kelp and seagrasses to grow. This in turn will aid coastal protection and increase carbon sequestration in the coastal area off Arklow. This type of project should be supported financially and practically as a part of the Decarbonisation Zone programme as it offers carbon sequestration opportunities also offers educational opportunities for the community in the area of marine conservation and a nature-based solutions approach to decarbonising our towns and cities. It can also provide a strong connection to the unique maritime heritage of Arklow. As water quality in Arklow improves following completion of the new wastewater treatment plant, the regeneration of natural coastal ecosystems – and potentially the native oyster - can be a strong symbol for the town in the future.

**Native Oyster Reef Restoration Ireland (NORRI)**

The first restoration goal is to identify suitable site for oyster reef restoration, along the Wicklow's coastal marine area, and establish it as a no-take Biomimicry LivingLabs® that can be replicated throughout Ireland and Europe.

Our solution for oyster habitat restoration uses six biomimicry principles: evolve to survive, adapt to changing conditions, be locally attuned and responsive, resource efficient, use life-friendly chemistry, and integrate development with growth.

The environment sets the limits for sustainable and resilient development and restoration, so our premise is to work with nature to help establish conditions conducive to life and help restore native oyster reef habitats, while improving water quality, marine biodiversity and help heal our environment.

Source www.norri.ie

**Figure 24 Arklow Bay**

Source : A. Frankic /Norri from Restoring Europe's Marine Environment (WWF)

## 8.3 Avoca River Catchment –land remediation and carbon sequestration in the context or river catchment restoration.

### 8.3.1 Background to the mining legacy

Mining in the Avoca area started back in the 1700's and continued until the 1980's. As a result of previous mining works, the Avoca River has for almost 300 years received discharges of acid mine drainage in the vicinity of Avoca village, leading to poor water quality in the river and affecting water quality in Arklow Bay.

There are historic mine workings on either side of the Avoca Valley (West Avoca and East Avoca) and the landscape includes spoil heaps, pits, shafts, underground drainage adits as well as numerous mining heritage features. A significant tailings facility is located at Shelton Abbey, 8km from the mining area, closer to Arklow town.

Between 1994 and 1997, Wicklow County Council led the 'Avoca / Avonmore Catchment Conversion Project', co-funded by the EU LIFE programme. A Catchment Conversion Plan was developed for the Avoca/Avonmore area, and the project included pilot trials on the rehabilitation of previous environmental damage in the area relating to effective leachate treatment and rehabilitation of spoil using composted sewage sludge. The trials explored the potential for various combinations of soil cover and vegetation types growing on top of phytotoxic spoil. Tree planting was one of the possibilities explored. The total area requiring revegetation is noted as 64 hectares. The socio-economic and environmental baseline of the entire Avoca and Avonmore Catchments was considered, and the information fed into a GIS based Catchment Information System.

A comprehensive study into the river water quality problem was commissioned by the Eastern Region Fisheries Board (now Inland Fisheries Ireland). A report entitled 'Restoring the Avoca River' was published by the University of Newcastle in 2003. The report was a scoping exercise, involving widespread consultation, to identify and develop outline costings for remediation measures which can restore the Avoca River to the status of a salmonid fishery. Fisheries surveys of the river indicated that salmon and trout fish stocks are present in the system and that the system has excellent potential as a recreational salmon and sea trout fishery. Prospects Having examined various remedial options, the report recommended active treatment of the toxic discharges to the river (by means of a treatment plant).

Further work was carried out in 2007 as part of a 'Celtic Copper Heritage' project, including a remediation trial of three-month duration at Avoca, treating the acid mine drainage from two locations near Avoca village. This reported reasonable success in extracting metals from the discharge and calculated the likely capital and operational cost for a full-scale treatment facility.

In 2005 the government approved funding for the Geological Survey of Ireland (GSI) to carry out an Integrated Management Plan for Former Mine Sites for the Avoca mining area. Completed by consultants CDM in 2008, the overall objective of the feasibility study was "to prepare a realistic, cost-effective, and achievable integrated management plan for the site that addresses the many issues at the site including human and ecological concerns, safety and physical hazards, heritage, future uses, and long-term site management".

***Environmental Issues***

The main issue from the Avoca site is AMD. Metal laden, low pH water is entering the Avoca River either as point discharges from adits or as diffuse flow. Some of the tributaries in the area are also contaminated and also add to the contamination of the river. This has an adverse affect on the aquatic habitat and the biodiversity of the river.

Over many years, some of the sediments in the river have become ferricreted and these contribute to the ongoing contamination of the river.

All the spoil piles have a high acid generating potential which contribute to the degradation and contamination of both groundwater and surface water. There is little or no vegetation growth on these spoil piles leaving the contaminated material accessible to animals and people.

**Figure 25 Excerpt from CDM Integrated Management Plan for Former Mine Sites**


**Figure 26 Site Map of Avoca Mine Area (CDM Report, 2008)**

The CDM report developed a comprehensive approach to managing safety and environmental protection in the catchment. A programme for 'solids' will include measures such as stabilisation of spoil piles, minimising infiltration of rainwater (capping and revegetation) and addressing geotechnical hazards and human health risks. A programme for 'water' will include developing an active water treatment plant to neutralise acid-mine drainage using lime, groundwater containment and extraction, and other measures. Proposals are also included to improve the Shelton Abbey tailings site. Two alternative options are presented to deliver the necessary remedial measures, and the associated capital costs were of the order of €60m-€75m (in 2008). The project works were expected to take between three and six years to carry out, once the design, planning and procurement phases had been completed. There would be ongoing operational costs for the programme.

### 8.3.2 Opportunities to connect restoration of the Avoca River catchment with the Decarbonisation Zone project

In recent decades the main socio-economic barriers to Arklow's development have been lack of municipal wastewater treatment and flooding concerns. Both of these problems are on the cusp of being addressed by

major capital investment projects. The other underlying environmental problem for the town has been the poor water quality of the Avoca River because of the mining heritage.

The Decarbonisation Zone project can potentially connect with the overall Avoca River catchment improvement.

One element of the comprehensive remediation of the mining area will be reprofiling, capping and revegetating a number of extensive mining spoil areas. If developed as woodlands, these areas have the potential to serve as carbon sinks. This could contribute to the overall decarbonisation effort for Arklow.

Further connections between Arklow and its river catchment can be fostered, for example enhanced fisheries and recreation along the river, the potential for greenways and trails, and the tourism potential of the industrial mining heritage of the area.

Partnership with GSI, DECC and IFI will be required to create impetus. There is potential for an innovative green finance initiative, relating to the long-term biodiversity and carbon benefits that the mine remediation project can deliver.

# 9 CROSS-CUTTING ACTIONS

## 9.1 District Heating

A Spatial Energy Demand Analysis has been carried out as part of the DZ Implementation Plan project. This includes mapping of published heat demand density in the town (based on SEAI datasets), municipal heat demand data from WCC, and knowledge of proposed significant projects. According to CODEMA, "The best DH opportunity areas are those that have:

- • High heat demand density (both existing and planned),
- • Proximity to existing heat sources,
- • Minimal physical barriers along DH network route"

(Transition Roadmap for Developing DH in South Dublin (CODEMA, 2019))

A modern District Heating solution will avail of a low-carbon renewable heat source. In Arklow, the potential sources include two separate proposed Data Centres to the edge of the town, the Geothermal heat source beneath the town, and a proposed Anaerobic Digestion facility. Other sources could be combined with these, for example biomass combustion (e.g., forest residues) or conceivably green hydrogen produced using excess off-shore wind energy. DH networks will often combine more than one source of heat.

Initial mapping suggests that relevant heat sources and clusters of existing or new heat users can be identified in the town. Figure 27 below represents an initial appraisal focussing on demand from commercial and industrial zones and proposed new development (or redevelopment sites).

On the demand side, already a potential cluster of existing heat demand to the north of the Avoca River (two swimming pools, and a major commercial development (Bridgewater) appear as a potential demand cluster). Other attractive opportunities can be seen in proposed regeneration areas (waterside area) and in greenfield residential lands on the southern fringe of the town.

A **District Heating Feasibility Study** for Arklow will enable closer examination of the potential low-carbon heat sources and potential anchor customers for heat demand in the town. Such a study will drill down further into the existing energy demand for individual business, as well as likely further energy demand for future regeneration and greenfield development zones. As well as technical analysis it will also address investment and operational costs, and the operational (business) model that would suit Arklow. The experience of Tallaght DH scheme will be beneficial. A number of funding opportunities exist for co-funding of such a study.

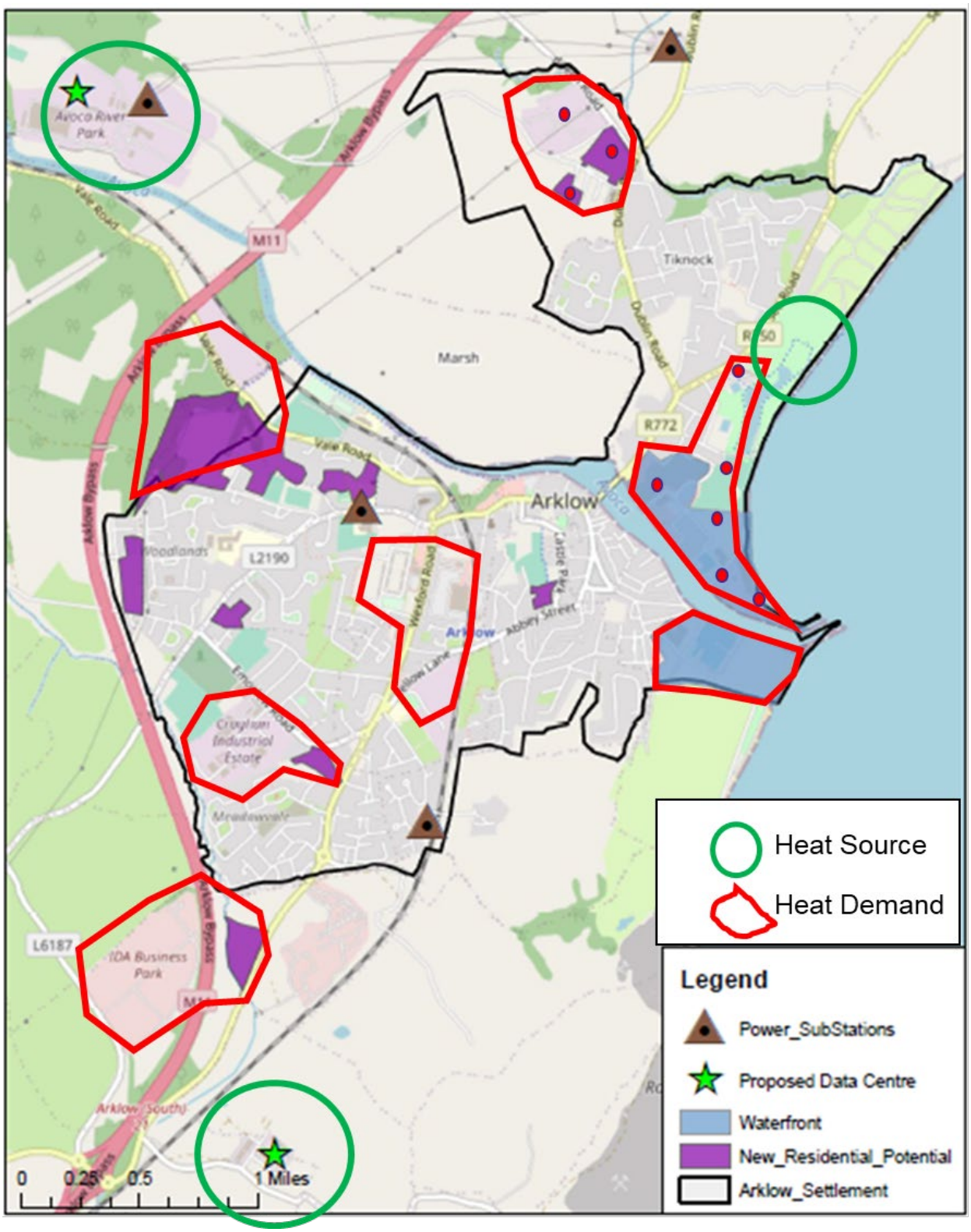


**Figure 27 - Indicative clusters of potential high heat demand, and low-carbon heat sources.**

**Table 18 District Heating Potential**

| Goal | **Install District Heating network using low-carbon renewable heat sources (e.g., Data Centre waste heat) to provide heat to homes and businesses in Arklow.** |
|---|---|
| **Scope/ Description** | Combination of:<br>• Using low carbon heat source (e.g., Data Centre, Geothermal, Biomass Combustion) in Arklow to provide heating to local homes and businesses.<br>• Laying new DH pipework<br>• Creating energy supply company to manage and operate the system.<br>• Reduce use of fossil fuels (gas, kerosene, coal) for heating. |
| **Carbon Reduction in 2030** | TBD $CO_2$eq per year |
| **Co-Benefits** | Health benefit<br>Improved air quality (less combustion of fossil fuels)<br>Lower heating costs; as carbon tax increase heat from district heating may become cheaper option for customers.<br>Reduce the use of immersion tanks – people will have hot water on demand.<br>More space available in buildings due to removal of boilers.<br>Lower maintenance cost for customers. |
| **Responsible** | WCC, SEAI, DECC – Eventually Energy Sector Partners |
| **Cost** | Not Available |
| **Funding** | DECC/ SEAI / European Interreg funding<br>Private Investment |

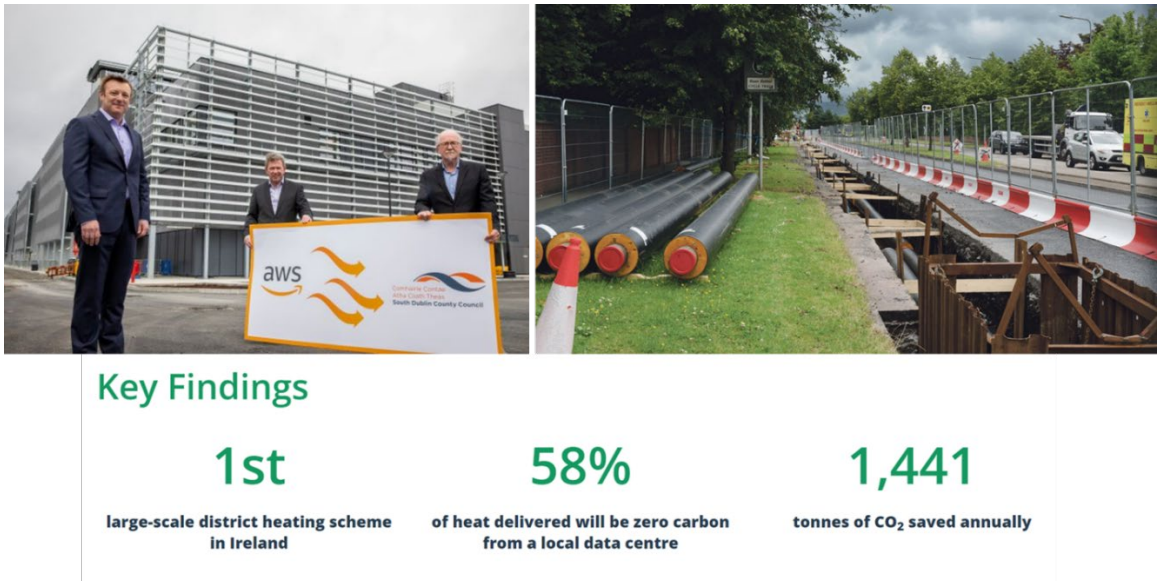


**Figure 28- Overview of Tallaght District Heating, which was spearheaded by SDCC and CODEMA.**

## 9.2 Community Projects

## 9.3 Maritime Opportunities

Arklow has a rich maritime heritage. The Arklow Maritime Museum, displays information on the maritime history of Arklow, focusing on its boat building, lifeboat, and fishing traditions. Its website illustrates the history of the town, from Viking times up to more recent cycles of industrial growth and decline.

The harbour still performs a commercial function, accommodating cargo vessels and fishing boats. Arklow Dock is the proposed location for the Operations and Maintenance Facility for the Arklow Wind Park project (SSE Renewables), which is currently at planning application stage.

Arklow Marina is situated on the North Bank of the river, upstream of the commercial quays. The marina has 42 berths in the inner basin and a further 30 berths on river side pontoons. Arklow Sailing club is located nearby. Other recreational opportunities such as kayaking are also available.

The proposed flood relief scheme and the new wastewater treatment plant will both bring public realm enhancements to the waterside and cleaner water for recreation. Other opportunities for regeneration of the harbour and dock areas are also being developed.

The Decarbonisation Zone can therefore incorporate a rejuvenated maritime environment. Ways in which synergies can be developed include:

- Developing proposals and policies for a low-carbon harbour environment.
- Charging points for electric charging of pleasure craft and commercial vessels in the future, as they switch from diesel power.
- Enhanced amenity slipways and access points, to enable eco-tourism built around the river and coastal amenities
- Synergy with the innovation in coastal habitat improvement such as the NORRI project.
- Building the harbour regeneration around a District Heating concept.

**Figure 29 Arklow Harbour**

## 9.4 New Public Infrastructure Projects

Two significant public infrastructure projects will take place in Arklow in the coming years, namely the new Wastewater Treatment Plant (WWTP) being developed by Irish Water, and the proposed Arklow Flood Relief Scheme (FRS), being developed by Wicklow County Council and the Office of Public Works (currently awaiting planning approval by An Bord Pleanála).

### 9.4.1 Arklow Wastewater Treatment Plant.

The Arklow Wastewater Treatment Plant Project will include:

- A new, state of the art, wastewater treatment plant that has been designed to provide an ultimate treatment capacity for a PE (population equivalent) of up to 36,000 at the Old Wallboard Factory, North Quay, Ferrybank (Site location shown in the image below taken from Irish Water website).
- Sewer pipelines (along the North and South Quays) to bring the untreated wastewater to the WWTP
- A marine outfall pipe to safely discharge the treated wastewater to the Irish Sea

Works got underway in 2021 with a projected four year duration.

**Figure 30 Arklow Waste Water Treatment Plant Site**


**Figure 31 Arklow Waste Water Treatment Plant**

## 9.4.2 Arklow Flood Relief Scheme

A number of excerpts from the FRS are reproduced below taken from the Environmental Impact Assessment Report by ARUP consultants. The construction programme will be over five years, therefore the construction project will form the backdrop to the Decarbonisation Zone actions for the coming years.


**Figure 32 Arklow Flood Relief Scheme**


**Figure 33 Arklow Flood Relief Scheme Objectives**


**Figure 34 Public ream proposals for River Walk, Arklow, under the FRS design.**

### 9.4.3 How can these projects contribute to the Decarbonisation Zone?

Both public projects will enhance the amenities of the town. The flood relief scheme will stimulate more investment in town centre businesses and will enhance the public realm. The wastewater treatment plant will improve environment and water quality and enable expansion of the town. It may be possible to connect the DZ initiatives with both projects, for example:

- Exploring how the construction projects themselves can be made low-carbon exemplars. For example, setting a goal for measurement and reduction of embodied carbon in the project implementation, and exploring the use of low carbon construction equipment.
- Looking for circular economy solutions for waste or surplus materials generated by the projects: can they be used in other projects in the town, for the benefit of decarbonisation?
- Where streets are being disrupted for laying of new services, avail of this opportunity to upgrade or install other infrastructure such as upgraded telecoms, or even district heating pipework.
- Build synergy with the active travel and public realm proposals for the DZ – co-ordinate the delivery of infrastructure for the public realm improvements and re-instatement measures.
- Enhancing biodiversity and carbon sequestration in any reinstatement or landscaping proposals.
- Stimulate community involvement: major projects such as these have active public participation interfaces, and these can engage the public in how the project will benefit the town and the decarbonisation effort.

## 9.5 Development Planning and the Arklow Local Area Plan

Arklow will grow in population and employment in the coming year, particularly with the availability of the new wastewater treatment plant and the economic activity associated with major investment in offshore wind energy and potentially Data Centres.

New development areas, and regeneration sites such as the waterfront area, should be planned and developed as low-carbon or even **Net Zero Carbon** zones. This will include:

- Planning for compact, walkable, and interconnected areas, where active travel is the main mode of transport.
- Encouraging low-impact communities, that favour circular economy and sharing of resources rather than consumerism.
- Achieving buildings and infrastructure with a very low embodied carbon – for example reusing buildings or components, using low carbon building materials such as timber, using low emissions construction plant and techniques.
- Nearly Zero Energy Buildings – ensuring very high energy efficiency, low energy consumption, and incorporation of on-site renewable energy

A truly Net Zero Carbon District will also calculate its residual carbon footprint and develop ways (either directly or through purchasing carbon offsets) to balance these emissions so that the overall activities are considered net zero.

The **Arklow Local Area Plan** will be the statutory tool to give expression to the DZ objectives, and to make compliance mandatory for new developments. The LAP can also identify the opportunities for Net Zero Carbon developments and districts. Policies specific to Arklow can support new attitudes and practices in the town. Examples of measures to be considered include:

- Requiring District Heating compatibility or adoption in relevant locations and development types (as per SDCC development plan)
- Setting development standards that encourage active travel as opposed to private car ownership and ensuring connectivity for walking and cycling connections for new developments.
- Requiring Biodiversity Net Gain in new developments.

The current Arklow Local Area Plan 2018-2024 will be falling due for replacement in 2024, meaning the consultation process for updating the Plan will get underway in 2022/2023. This will provide the opportunity for integration of DZ objectives into the planning framework for the town. The process can learn from the good practices in use throughout Europe to integrate climate action with spatial development planning.