



**WESTERN
DEVELOPMENT
COMMISSION**

Making the Transition to a Low Carbon Society in the Western Region

Key Issues for Rural Dwellers



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Foreword

The transition to a low carbon economy is one of many, almost overwhelming, challenges facing the Western Region, Ireland and the world more broadly at this point in time. However, this report 'Making the Transition to a Low Carbon Society in the Western Region— Key issues for rural dwellers' is most welcome given that rural dwellers account for 80% of the population of the Western Region¹. The report takes a balanced view in assessing the scale of the challenge and identifying practical, deliverable recommendations to facilitate the transition.

The focus on three key areas: energy efficiency and heat, transport, and electricity (both generation and demand) is timely given the recently published Programme for Government². In that context, and as part of the Western Development Commission statutory obligation, the report seeks to inform and advocate for the Western Region in the low carbon transition which is essential to the social and economic development of the seven counties of Clare, Galway, Mayo, Leitrim, Roscommon, Sligo and Donegal.

Energy Efficiency and Heat Detached houses account for 64% of all homes in the Western Region, significantly higher than the national average, and while around a third of the region's housing units were built between 2001 and 2010, many date back considerably further. This gives some sense of the scale of the retrofit challenge. The report's recommendation to include various retrofit and finance options means that rural dwellers in older homes, or those of lower value, will still see merit in incremental improvements.

Transport There are more than half a million people living in the rural Western Region, with a huge reliance on cars as a result. This creates challenges but also opportunities for compact development, remote working from home or the in the AEC and national hub network. It further identifies a need for data on rural travel and the nature of rural journeys which aligns with the work of the WDC as part of the Future Mobility Ireland Campus in Shannon Co. Clare.

Electricity Use and Generation The Western Region generates 120% of its current electricity demand from renewable sources. This is likely to grow in the transition to a low carbon economy. Community engagement and support for this increased generation is vital, and the Renewable Energy Support Scheme, which will enable communities to generate both energy and revenue, offers huge potential for rural areas. Enabling infrastructure and grid capacity is a pre-requisite for both community and industrial development.

I wish to draw attention to these areas, both to highlight them, and also as an indication of the relevance and depth of this work. For that I want to thank the lead author Dr Helen McHenry, the policy team and other colleagues at the Western Development Commission. The Programme for Government is ambitious in addressing these challenges and broad societal support and significant resources will be needed for delivery and to ensure that issues for rural dwellers addressed as part of the Just Transition.

The Western Development Commission is committed to working with communities, with both public and private stakeholders, as part of its 'Work Smarter, Live Better' strategy to facilitate the transition to a sustainable, low carbon economy and a brighter future for all.

Tomás Ó Síocháin
CEO, Western Development Commission
July 2020

1 Using the definition in Ireland 2040 Our Plan

2 Programme for Government—Our Shared Future, June 2020

Summary

The need for climate action is clear and the changes we need to make to address climate challenges will affect all aspects of the way we live our lives. They will have diverse and wide-ranging impacts across Ireland, yet there has been very little focus on climate change and emissions issues for people living in rural areas.

Discussions of rural emissions often focus on the emissions from agriculture, in this study the focus is on people living in rural areas, the 'rural dwellers', rather than agriculture. There are opportunities and challenges ahead and we need to understand the scale and scope of the actions required to reduce rural dwellers emissions and increase the use of renewable energy in rural areas.

As the Western Region³ is largely rural, the work of the Western Development Commission (WDC) has a particular focus on the needs of and opportunities for more rural and peripheral areas. Energy and climate action will bring important opportunities to our largely rural region, but at the same time it will bring challenges that need to be addressed for the region to make the transition.

This study of what is needed for a transition to a low carbon economy in the rural Western Region is one of eleven pieces of research under Action 160 to "Assess the economic and employment implications of the transition to a low-carbon economy" which fall under the Citizen Engagement, Community Leadership and Just Transition in the Climate Action Plan⁴.

Taking action to address rural dwellers' emissions brings with it the potential for significant benefits in terms of warmer homes, cleaner air, and more sustainable use of our abundant natural resources. But it will be a major challenge and will require significant changes in the way we live, work and do business.

The Programme for Government commitment to an average 7% per annum reduction in overall greenhouse gas emissions from 2021 to 2030 is to be underpinned by the core philosophy of a Just Transition, ensuring that no sector of society or community is left behind in the movement to a low-carbon future. This is important for rural regions.

Rural dwellers have different energy needs and often have reduced or more costly choices than their urban equivalents. Rural individuals are thought to have a larger carbon footprint than their urban counterparts and need greater access to cleaner energy choices. At the same time the sources of clean energy for all citizens are largely rural based.

In looking at the three modes of energy use by rural dwellers the study considers what we know about our current situation, the changes we will need to make in how we use energy and so reduce emissions, and some of the opportunities this may bring. We consider key climate mitigation issues from a Western Region perspective but, as the Region is predominantly rural, the findings and the analysis are relevant to other Irish rural areas. The study brings together available data to give us a better understanding of where we are starting from and the issues to be addressed.

This report examines the three aspects of energy use, and therefore, emissions by rural dwellers which can have significant climate implications:

- Transport
- Energy efficiency and Heating in rural Western Region homes
- Electricity (both demand and supply).

We have also produced a background report with significantly more data and information about patterns of behaviour and the challenges for the rural Western Region⁵.

3 There are seven counties in the Western Region under the WDC remit: Donegal, Sligo, Leitrim, Roscommon, Mayo, Galway and Clare.

4 <https://www.dccae.gov.ie/en-ie/climate-action/topics/climate-action-plan/Pages/climate-action.aspx>

5 It is available at www.wdc.ie/publications



1

People living in rural areas tend to be at a greater distance from services than their urban counterparts and so the journeys made tend to be longer and more car based. Greater distance to employment and services reduces options for travel and lack of public transport and the distance to public transport services, increases reliance on car travel in rural areas.

2

To reduce the carbon intensity of rural travel we need a clear focus on finding solutions. We need to find out what works in rural areas and small towns by piloting infrastructural investments and trying novel approaches to sustainable travel for example in relation to lift sharing, public transport use and active travel so that potential solutions tested and learned from.

3

The Avoid-Shift-Improve (ASI) framework should be used to plan reductions in emissions from transport, otherwise the focus tends to be on the improving how we travel (e.g. electric cars rather than diesel or petrol cars), at the expense of avoiding and shifting travel options to facilitate systemic change.

4

While the avoidance of travel, for example by promoting increased remote working or local retail delivery, should be the key focus of policy to reduce carbon intensity, encouraging households with more than one car to choose an EV as their second vehicle would also be useful.

5

Given the likely slow transition to electric vehicles, and the life expectancy of the current car fleet (to 2030 and beyond), the Biofuels Obligation Scheme should be enhanced and a move to the higher E10 and B12 standards should be implemented as soon as feasible. This would make a significant difference well before 2030.

6

Services such as EV charging points and CNG fuelling points must be widely available in rural areas where population is dispersed. Without these services being available and reliable, rural dwellers could be reluctant to adopt the new technologies. Similarly, it could deter visitors who might be concerned about the availability of charging/fuelling points. In the case of HGVs and buses, lack of refuelling options could increase costs of delivery or services in more rural and peripheral regions.

7

While EVs are one low-carbon transport solution, public transport, walking and cycling have important roles to play in rural areas. The options for promoting these in ways tailored to the needs of rural dwellers should form an important part of the Sustainable Rural Mobility Plan which is a commitment in the Programme for Government.

8

Remote working (from home or from alternative workplaces such as hubs, which require shorter journeys) reduces the numbers of journeys made quite significantly, and has considerable benefits in terms of quality of life as a result of reduced time spent commuting. It also reduces congestion at peak times. The Atlantic Economic Corridor (AEC) Hubs Project, coordinated by the WDC, will create an interconnected community network from 101 hubs in the AEC region. Further promotion of this option, following the Covid 19 pandemic, is important.

9

Car sharing may be a useful substitute for owning a second or third vehicle, though access to the car share location may require a journey. Lift sharing is another option reducing the overall number of journeys being made. Developing pilot models for these and examining what works in rural Ireland will be an important step in increasing the use of this option.

10

To improve public transport use, the level and timing of rail services is important. Regular scheduled services are crucial, but in order to allow the use of mainline rail for commuting to work it is important that services arrive into regional towns at times which allow for travel to work. Likewise the fares need to be competitive for shorter journeys on the mainline rail to encourage travel to regional cities and towns by rail.

11

Commercial bus operators provide a significant proportion of scheduled bus services between cities and towns in the Western Region but there is little data on passenger numbers or frequency. This can lead to underestimation of the use of public transport in the region. Integration, at least to some extent, of the timetables of the different bus operators would be helpful to users who may be connecting across different services.

12

There is considerable potential for increased use of the Local Link rural transport service, particularly among those who do not have access to a car and may currently need to be driven. Promoting the existing services in their catchment areas and developing suitable timetables in consultation with potential users will help increase service use, along with the availability of real time data and user apps.

13

Where a service exists, bus stops or covered bus shelters, signage and information should be available. An Information app on availability/ timing should be developed to ensure real time data is available on rural transport. This is a greater need in rural areas where public transport is less frequent.

14

Collecting real time data on travel patterns in rural towns and villages is vital to inform policy and solutions. There is scope to work with Future Mobility Campus Ireland in Shannon where the WDC is a project partner, to develop a rural mobility testbed similar to the urban site in Shannon.

15

The opportunity to make the school bus services and other transport services for rural people available, where suitable, to all rural dwellers should be explored to get the best possible value for these services.

16

While in many situations people have no option but to drive to their local town, there should be an effort to encourage walking between shops or services within the town, leaving the car parked in one spot for the duration of the visit. Any planning for new retail or other services should require good access for walking and cycling.

17

Local authorities should examine the access roads within a 10km radius of towns to ensure they are as safe as possible for cyclists. In many situations, small changes will make the journey safer and more comfortable for cyclists, while signage will remind drivers of the need to be aware of cyclists as well as highlighting cycling as a viable travel option. As well as having tourism benefits, Greenways should be planned as viable low-carbon transport routes to town and village centres.

18

Normalising walking and cycling as viable travel options in rural areas is essential. They shouldn't be considered unusual, risky or the preserve of a small minority. This normalisation will occur as participation increases but also as the infrastructure for active travel is improved and the options are more visible and safer.

19

Addressing issues for multi modal travel is important. 'Park and ride' should include parking at train stations or places to catch bus services. Lack of safe, available parking can be a disincentive to longer public transport journeys and should receive more investment. Bike parking which is secure and dry should be provided at rail stations and key bus stops.

Rural Homes



20

The focus of energy efficiency retrofitting is likely to be on homes built before 2011. In the Western Region 93% of homes (280,949) were built before 2011. These are likely to require some form of energy efficiency upgrades and fuel switching to complete a move to a low carbon economy.

21

A focus on existing buildings is essential. The longevity of buildings and the building stock (typically 50–100 years) means that for a very long time ahead the majority of the building stock will be from an era with less stringent energy efficiency regulations.

22

Energy efficiency is important and the ambition in the Climate Action Plan and Programme for Government to upgrade at least 500,000 homes to a BER rating of at least B2 is very welcome. With only 5% of Western Region homes achieving a BER rating of B2 and higher it means that almost 267,000 homes would need to be retrofitted.

23

The first step towards a low carbon region must be to improve energy efficiency. Deep retrofit is ideal but it is also important to promote those energy efficiency measures which improve the insulation and warmth of the home and move from BER of F or G, even if they do not include all measures and remain at C or D rather than fully upgrading to A or B standards.

24

Low levels of energy efficiency and a reliance on home heating fuels with the greatest emissions (oil, coal and peat) mean there is a particular need to specifically address energy efficiency and home heating issues in the Western Region and other rural regions.

25

The Programme for Government commits to using resources from the National Recovery Fund to immediately finance local authority retrofit programmes and to offer grants to owners of private properties. This effort will initially be focused on the Midlands, where dependence on fossil fuel is greatest. Given the reliance on oil as well as coal and peat in the Western Region it should be included in the first stage along with the Midlands.

26

In addition to energy efficiency retrofits the heating systems in buildings heated using the most carbon intensive fuels (oil, coal and peat) will need to be changed. In the Western Region more than 80% of homes use oil, coal or peat for central heating, compared with 44% of homes in the rest of the state. Clearly homes in Western Region counties need to be prioritised in the switch to low carbon heating.

27

The focus of the Climate Action Plan and the Programme for Government is on heat pump installation, along with retrofit, and there is to be a target to install 400,000 heat pumps in homes by 2030). This is likely to be most appropriate for homes heated using oil. Almost 60% of homes in the Western Region use oil for central heating compared to 36% in the rest of the state.

28

The recent significant fall in oil prices will have significantly affected the payback periods for home owners planning to increase the energy efficiency of their homes or switch to a more renewable heating system. This means that higher incentives may be required to achieve change.

29

In some situations, the use of wood biomass for heating may be more appropriate than heat pumps, particularly in rural dwellings with more space for storage and with easier access to wood fuels and other renewable energy. The WDC has shown that the renewable heat market has the potential to create considerable levels of employment across the Western Region and to provide long-term stable markets for low value wood.

30

Wood fuel should be used correctly in appropriately designed boilers and stoves. The wood used should have a low moisture content (less than 20%) so it must have been correctly seasoned or dried. It should be from forest by-products, creating a value for thinnings and for brash or parts of the trees which do not have other commercial value.

31

There is potential to develop district heating in some towns in the Western Region. Population density and scale of heat demand are important for viable district heating projects which require capital intensive investment in the network. The most suitable rural town locations in the Western Region should be explored given the focus in the Programme for Government on developing this heating solution.

32

There is significant future potential for more energy efficient homes with renewable heat in rural areas, but rural dwellers may lack the financial resources to switch to low carbon or carbon free alternatives. Issues for rural dwellers, including those who own their homes, need to be addressed by the Just Transition Commissioner.

33

There should be 'Demonstration homes' in each county where people can see how low carbon systems operate and have the opportunity to learn from that householder's experience.

Electricity Use and Generation



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The 2030 target of 70% electricity generation from renewable sources is necessary to facilitate the move to a low carbon society and will be a very significant driver of change and. Rural dwellers have a role to play in terms of making a contribution to electricity supply, through microgeneration and involvement in community renewable electricity generation projects or, potentially, as shareholders in other renewable projects.

35

A significant move to Electric Vehicles (EVs) will increase domestic demand. Most EV charging is likely to take place at home and rural homes with off street parking are particularly well suited to this. The lack of other transport options is likely to mean, in the longer term, a higher number of EVs per rural household than urban, as is the case with cars at present. Similarly, the longer distances to be travelled will mean higher electricity consumption by rural vehicles.

36

The WDC is working with more than 100 hubs along the Atlantic Economic Corridor. There are opportunities for enterprise hubs to provide vehicle charging services, and similarly these should be offered at Broadband Connection Points, and public wifi access points. We will work to pilot vehicle charging services for people working in the Hubs, and pilot the provision of real time information and access to hot desking services for people needing to charge their vehicle during a journey so that they can work or reconnect while they wait.

37

The phased rollout of 250,000 new smart meters has begun. It is expected that electricity supply companies will begin to offer new smart products and services and households will be able to shift some consumption to times of the day when electricity is cheaper. It is important that pricing and electricity management structures do not significantly disadvantage those consumers using older equipment, with less money to invest in more expensive electricity appliances, or who are less able to engage with and respond to the information provided by smart meters.

38

Rural areas are the site of most electricity generation and with the move to 70% renewable electricity, the location of generation will often be in areas with most wind or potential for solar generation. This means that many rural dwellers in the Western Region are, and more will be, living in proximity to wind and solar farms and the infrastructure needed to transmit and distribute electricity from them. This has, on occasion, given rise to concerns for rural dwellers and delays in electricity infrastructure development.

39

While the need to resolve the climate crisis provides an urgent rationale for investment, and the shift to renewable energy has important benefits for our society, it is important that the benefits of the investment and infrastructure are shared with the rural areas where the infrastructure is located and that there is a true participative approach to consulting, planning and building the required network. The rural areas need to benefit economically from it too, not just in terms of community funds but also as a means of increasing employment in rural communities.

40

At a community level, there are options for rural areas to become involved in the Sustainable Energy Community (SEC) network. Each community develops an energy use masterplan covering all aspects of energy use and resources. The focus is not just on electricity but on increasing the efficiency and sustainability of all energy use and will form a key part of the rural transition.

41

At a small scale there are significant opportunities for individual rural dwellers to become involved in microgeneration which can be for used immediately or stored. The Climate Action Plan and the Programme for Government commit to the launch of a pricing support regime for micro-generation which will mean householders will be able to sell excess power back to the grid by June 2021.

42

There is significant future potential for electrification of heat and transport in rural areas, but many rural dwellers lack the financial resources to switch to low carbon or carbon free alternatives. It is important that we recognise this in planning a Just Transition.

43

The Western Region already has a significant connected renewable generation; more than half (55%) of the generation capacity in the Region is renewable and the Western Region is currently producing enough renewable electricity to meet 120% of its own demand. This means Region is a net provider of renewable electricity to the rest of Ireland making a significant contribution to the 2020 RES-E targets and to the target of 70% renewable electricity generation by 2030.

44

There is capacity in the current transmission system for more renewable generation in areas of the Western Region including large parts of Co. Roscommon, Co. Clare and Co. Galway. However, there is concern about the slow pace and scale of development of new transmission circuits elsewhere in the Region. The areas of particular concern for future generation connection in the medium term are Co. Donegal and North Mayo.

45

The WDC will work with developers, users state agencies and those impacted by infrastructure to consider how best to support electricity infrastructure investment in the region where it is necessary.

Conclusion

The climate challenge is complex. It affects all aspects of our lives, with many changes needed in the ways we live and work, some small and incremental and others very big. There are few simple solutions and, most importantly, there is no single solution in any area. It is important that we consider all ways of addressing the climate challenge and all ways of reducing our energy use and emissions.

We have examined the challenges for our homes in terms of efficiency and heating. They are significant but newer homes are more efficient and our older homes can be made so. There are low carbon choices for the way we heat our homes. The challenges in transport are also significant, but the opportunities, for remote work, for more active travel and for increased public transport in rural areas, alongside a move to more EVs will all make a difference. We will use more electricity, and there will be a need for more electricity generation and infrastructure, but there are opportunities for people and communities to participate in this and benefit from the change.

Rural dwellers will be significantly affected by the low carbon transition. Some of the changes will cost money and the significant increases in carbon taxes will cost rural dwellers more than others. The government is committed to a just transition. This should mean the higher costs and greater complexities of the transition for rural dwellers are addressed.

Pursuing a low carbon vision for the Region will not only contribute to achieving Ireland's climate change commitments but can also deliver wider benefits. These include improved energy security, and economic opportunities from renewable and indigenous fuels along with significant benefits in the areas of health, lifestyle, travel costs, local environment and air quality. Rural dwellers need to make the most of these benefits too. The focus of this report has been on the rural Western Region but our findings are applicable to much of rural Ireland and actions can be replicated elsewhere and implementation of changes can be integrated.

This report, which focuses on the current situation and where we need to be in a low carbon future, is just a start. The WDC will continue to work on the move to a low carbon Western Region. We will work with the Just Transition Commissioner to ensure that the needs of our region in relation to retrofit and changing heating systems are prioritised and with agencies across the Region to make our Region a model for low carbon rural areas. Our regional remit means we are uniquely placed to coordinate and share experiences across counties and among local and regional organisations.

We will promote practical, effective change in the way we live, work and do business in the Region so that our communities, our society and our regional economy are ready to meet challenges and prepared to take the opportunities the low carbon transition will bring.

1

Introduction



The need for climate action is clear and there is strong commitment to taking action in the Programme for Government⁷. The changes we need to make to address climate challenges will affect all aspects of the way we live. They will have diverse and wide ranging impacts across Ireland, yet there has been very little focus on climate change and emissions issues for people living in rural areas, although their energy use and emissions patterns are often different.

The Western Region, under the remit of the Western Development Commission (WDC), is largely rural region and includes in some of the most remote parts of the state. Most of the population of the Region lives in the open countryside and smaller towns. Therefore, WDC work has a particular focus on the needs of, and opportunities for, more rural and peripheral areas. Energy and climate action will bring important opportunities to our largely rural region, but at the same time it will bring challenges that need to be addressed for the Region to make the transition. We need to understand the scale and scope of the actions required to reduce rural dwellers emissions and increase the use of renewable energy in rural areas.

This report identifies the nature and scale of the climate challenge for the rural Western Region⁸, outlining the issues in relation to transport, homes and electricity – the three areas of energy use and associated emissions. This focus is on climate mitigation issues affecting rural dwellers in the Western Region, rather than on climate adaptation measures and while discussions of rural emissions often focus on the emissions from agriculture, in this study the focus is on people living in rural areas, the ‘rural dwellers’, rather than agriculture.

The need to ensure that the impacts, options and opportunities for rural dwellers are considered in relation to the low carbon is recognised in both national and organisational strategy and so the WDC proposed this study. It is one of eleven pieces of research to “Assess the economic and employment implications of the transition to a low-carbon economy”⁹ which fall under the Citizen Engagement, Community Leadership and Just Transition in the Climate Action Plan¹⁰.

Taking action to address rural dwellers’ emissions brings with it the potential for significant benefits in terms of warmer homes, cleaner air, and more sustainable use of our abundant natural resources. But it will be a major challenge and will require significant changes in the way we live, work and do business. It is recognised¹¹ that climate actions such as increasing carbon taxes particularly affect rural areas while the options for rural dwellers to change their behaviour are limited. Rural dwellers have different energy needs and often have reduced or more costly choices than their urban equivalents. Rural individuals are thought to have a larger carbon footprint than their urban counterparts¹² and need greater access to cleaner energy choices. At the same time the sources of clean energy for all citizens are largely rural based.

While the focus of this work is on the changes needed to be made to reduce the emissions produced by rural dwellers, it is also important to be aware that people’s carbon footprints are closely linked to their incomes and consumption patterns and so do not necessarily relate directly to their location (urban or rural).

The Programme for Government commitment to an average 7% per annum reduction in overall greenhouse gas emissions from 2021 to 2030 is a challenge and to meet this target changes will need to be made in all sectors and by all parts of our society. The way we meet the commitment is to be underpinned by the core philosophy of a Just Transition ensuring that no sector of society or community is left behind in the transition to a low-carbon future. People in all parts of the country should be able to benefit from the new opportunities this Just Transition will bring. This is important for rural regions.

The report examines the three aspects of energy use and emissions by rural dwellers which can have significant climate implications:

- Transport
- Energy Efficiency and Heating in rural Western Region homes
- Electricity (both demand and supply).

7 Programme for Government—Our Shared Future, June 2020, <https://static.rasset.ie/documents/news/2020/06/programmeforgovernment-june2020-final.pdf>

8 There are seven counties in the Western Region under the remit of the WDC: Donegal, Sligo, Leitrim, Roscommon, Mayo, Galway and Clare

9 Action 160

10 <https://www.dccae.gov.ie/en-ie/climate-action/topics/climate-action-plan/Pages/climate-action.aspx>

11 <https://www.esri.ie/publications/carbon-taxation-in-ireland-distributional-effects-of-revenue-recycling-policies>

12 See more discussion on <https://wdcinsights.wordpress.com/2015/12/15/rural-dwellers-and-climate-change-mitigation/>

In looking at these three modes of energy use we consider what we know about our current situation, the changes we will need to make in how we use energy, and some of the opportunities this may bring. We have also produced a background report with significantly more data and information about patterns of behaviour and the challenges for the rural Western Region¹³.

In this study we consider key climate transition issues from a Western Region perspective but, as the Region is predominantly rural, the findings and the analysis are relevant to other Irish rural areas. The study brings together available data to give us a better understanding of where we are starting from and the issues to be addressed.

We see this report as the start of our work for a low carbon Western Region and over the coming months and years we will be working with other agencies, to drive forward the low carbon agenda in the region so that by 2030 we will be a lower carbon region and by 2050 will be carbon neutral¹⁴.



We see this report as the start of our work for a low carbon Western Region and over the coming months and years we will be working with other agencies, to drive forward the low carbon agenda in the region so that by 2030 we will be a lower carbon region and by 2050 will be carbon neutral.

The Western Development Commission (WDC) is a statutory body that was set up to promote both social and economic development in the Western Region (Donegal, Leitrim, Sligo, Mayo, Roscommon, Galway and Clare). It operates under the aegis of the Department of Rural and Community Development

This is a *WDC Insights* report prepared by Dr Helen McHenry from the Policy Analysis team at the Western Development Commission with support from colleagues in the team and from colleagues working on renewable energy projects.

¹³ It is available at www.wdc.ie/publications

¹⁴ The Programme for Government commits to achieving net zero emissions by 2050

2

Transport and Travel in the Rural Western Region



One of the essential elements of the transition to a low carbon Western Region will be emissions reduction from transport. Addressing transport emissions is a key element of the Climate Action Plan¹⁵. There is specific focus on the need to address rural issues under the transport heading (e.g. Action 94) to review public and sustainable transport policy¹⁶, and to publish a public consultation on public/sustainable transport policy, including rural transport. This recognises that rural transport needs are different. Likewise, the Programme for Government commits to the development of a Sustainable Rural Mobility Plan.

There has already been significant investment in rural transport options including the development of the Local Link bus service which brings an important public transport option to many rural dwellers. In the Climate Action Plan, the government has targeted an increase in the number of electric vehicles (EVs) to 936,000 (of 840,000 passenger EVs). Changes in transport will require different fuelling and charging options. The new Programme for Government makes a strong commitment to the development of all low carbon transport options and addresses a number of these issues.

One of the best ways to plan for reducing emissions from travel is to use the 'Avoid, Shift, Improve' (ASI) framework. The approach advocates, first of all, that we should Avoid or reduce the need to travel, reduce journey length or increase vehicle occupancy. The second part of the framework promotes a modal Shift journeys from cars to more active (walking and cycling) or public transport modes. Finally, the ASI framework seeks to Improve the efficiency of existing transport modes in a way that reduces their environmental footprint (e.g from petrol or diesel cars to EVs).

Addressing transport and travel in rural regions is complex. Understanding transport as an enabling economic and social practice is essential to promoting positive behaviour change. Knowing the reasons for and the ways we travel means that we can better understand what we need to do to make the transition possible and ways to make it happen. Crucially, the Programme for Government commits to developing and implementing a Sustainable Rural Mobility Plan. This will introduce

a public transport service standard under which all settlements over a certain size in terms of population, combined with employment or education places, will have a service connecting them to the national public transport system. This is a very significant development. Local Link will play a key role in this development. This service standard will be informed by the Connected Ireland research being carried out by the National Transport Authority (NTA).

In this chapter transport in rural areas, and the Western Region in particular, is examined, setting out what we know about why and how people travel and considering options for reducing emissions from rural transport. There is more detailed data on rural travel patterns and mode of travel in the accompanying background report¹⁷. Breaking the direct link between journey numbers and economic growth will be essential to successful climate action. There are opportunities for rural dwellers (and others of course) for more home working and e-working in hubs and other locations which would avoid journeys. The potential for shifting or changing the way we travel promoting car and ride sharing, public transport and active travel in rural areas are also considered.

Why is the Western Region different?

When we look at the settlement pattern in the Western Region, some of the challenges for rural transport are immediately brought into focus. The Census of Population, 2016, shows that in Ireland just over a third (37%) of the population live in rural areas (that is outside towns of 1,500)¹⁸. In contrast, in the Western Region showed the opposite pattern with more 65%—than half a million people (535,953) living in the rural Western Region. Density is another key indicator of rurality and it certainly is important in considering the provision of services. The population density of the State is 70 people per square kilometre and in the more rural Western Region it is just under 32 people per km². Rurality and population density in Western Region counties is shown in Figure 1 below.

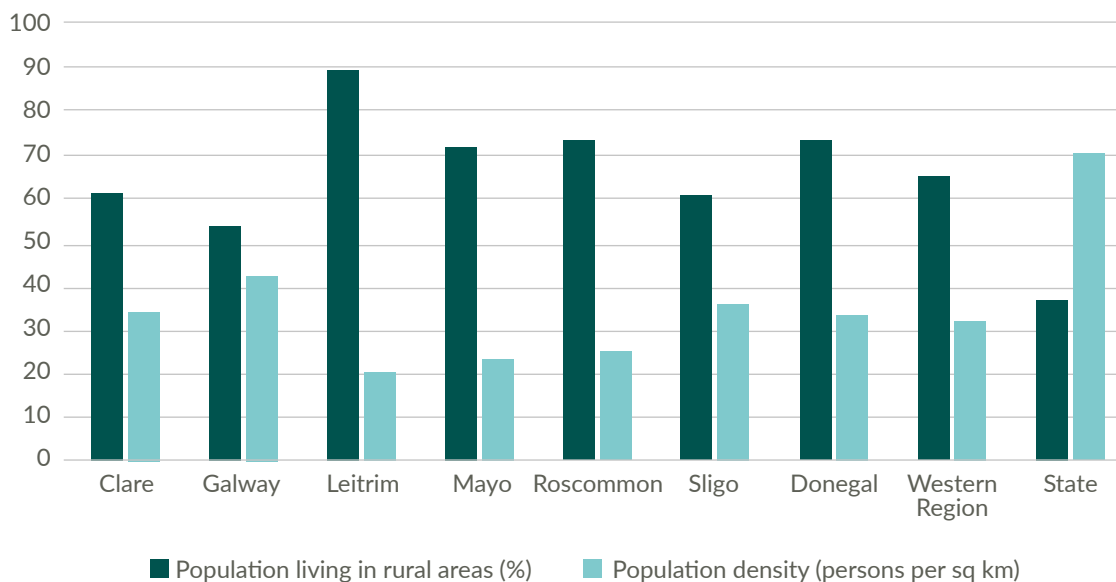
15 <https://www.dccae.gov.ie/en-ie/climate-action/topics/climate-action-plan/Pages/climate-action.aspx>

16 <https://www.gov.ie/en/consultation/f1b503-public-consultation-on-a-review-of-sustainable-mobility-policy/>

17 The background report is available at www.wdc.ie/publications

18 CSO Census 2016 Profile 2 E2008: Population Percentage in the Aggregate Town Areas and Aggregate Rural Areas

Figure 1: Percentage of Population living in rural areas and Population Density (persons per sq km) in the Western Region and State.



Source: CSO Census 2016 Profile 2, Tables E2008: E2013

The rural population of the seven counties varies from almost 90% in Leitrim (where there is only one urban centre over 1,500) followed Roscommon (73%), Donegal (73%) and Mayo (71%) are the most rural of the Western Region counties. Sligo (60%) and Clare (61%) are slightly less rural and Galway¹⁹ (54%) is the least as it includes the largest settlement of Galway City. The five most rural counties in Ireland (including Galway County) are all in the Western Region. Population density varies from 20 people per square kilometre in Leitrim to 42 people per square kilometre in Galway.

2.1

What journeys do we make?

The rural nature of the Western Region has implications for how we reduce transport emissions, but understanding the reasons we travel are also very important, in terms of options for reducing journey numbers and types, and the distances and nature of the journeys.

The CSO's National Travel Survey (2016)²⁰ gives a breakdown of the reasons for journeys made. The most important reason for a journey was for work, at almost 30% of journeys, but shopping (almost 22%) and companion and escort journeys (15%) were also quite significant. Journeys to 'visit family and friends', 'companion and escort' journeys and 'entertainment' are more important in rural than in the other areas. This may reflect the age profile of rural regions, with more older people (and often a higher child population) but with fewer in the working age categories.

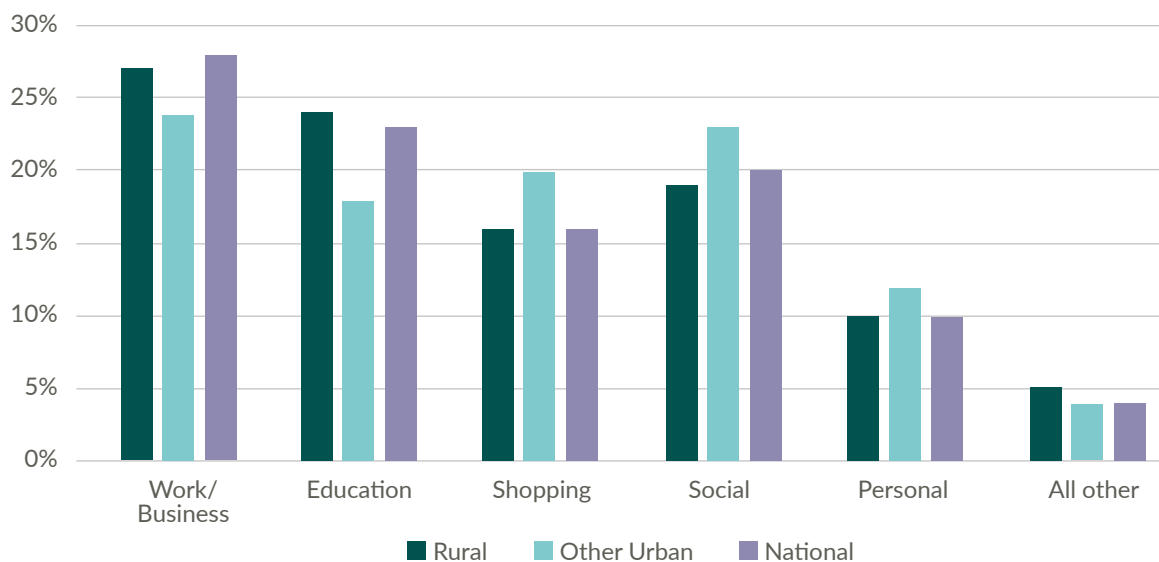
More information on travel patterns (Figure 2 below) comes from the National Transport Authority which conducted a National Household Travel Survey in 2017²¹. Again, travel for work or business is the most important category across all three areas, with travel for education more important in this survey (23% nationally). Education related travel was highest in rural areas (24%) again, perhaps relating to the relatively lower numbers in the working age cohort.

¹⁹ Galway county (i.e. excluding the city) is one of the most rural with almost 78% of the population living in rural areas.

²⁰ CSO Ireland, 2017, National Travel Survey <https://www.cso.ie/en/releasesandpublications/ep/p-nts/nts2016/>

²¹ The Household Travel Survey was also conducted in 2012 and is expected to be carried out every five years. <https://www.nationaltransport.ie/planning-policy/data-analysis/modelling/surveys-2/>

Figure 2: Reasons for Trips, National Household Travel Survey, 2017



Source: https://www.nationaltransport.ie/wp-content/uploads/2019/01/National_Household_Travel_Survey_2017_Report_-_December_2018.pdf

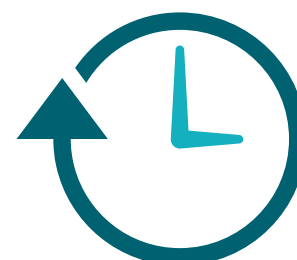
Car travel is a particularly dominant mode of transport for work and shopping. Potentially, both remote working and delivery from supermarkets, pharmacies and other local retailers which increased during the Covid 19 lockdown, may maintain its increased levels even as shopping and travel become less restricted. This would contribute to a reduction in journey numbers.

People commuting in rural areas without a dominant city travel to a variety urban centres for work. The recently released Urban and Rural Life in Ireland²², shows that more than three in four workers from rural areas do not work in a City. More than 90% of workers who lived in 'Independent urban towns', 'Rural areas with moderate urban influence' and 'Highly rural/remote areas' worked outside of the five cities while 76.1% of workers from 'rural areas with high urban influence' and 60.9% of workers in 'Satellite urban towns' did not work in a City.

Trips taken by Duration and Distance

Having considered the issues of population and population density, and well as the reason for travel in rural areas and Western Region counties it is also useful to look at distance and duration of journeys. In rural areas trips are most likely to take between 15 and 29 minutes (30% of trips), and the rest of the trips are spread fairly evenly by duration, although 7% are longer than an hour.

Trips made by people living in rural areas tended to take longer than those in urban areas and 80% of rural trips are 10 minutes or more.



22 <https://www.cso.ie/en/releasesandpublications/ep/p-urli/urbanandrurallifeinireland2019/commuting/>

Trips made by people living in rural areas tended to take longer than those in urban areas and 80% of rural trips are 10 minutes or more. Regional cities (population over 10,000) tended to have the shortest journeys (84% under half an hour)²³ with small urban centres being quite similar (83%) while in rural areas it was 72%.

Duration is of course influenced by distance travelled. Very few (6%) of rural trips were less than a kilometre, although 56% were under 10km. This is significant in relation to active travel options, which are discussed later. Up to 10km could be considered a reasonable distance to cycle while the option to walk could be considered up to 3km for many people.

Rural locations are more reliant on car transport than the rest of the country with more than 8 in 10 trips involving a car²⁴. This is likely to be for a combination of reasons including the longer distances to be travelled, lack of public transport options and relatively uncongested roads.

Reducing the need for rural travel, for example through increased remote working and supermarket and other delivery options will help reduce reliance on cars. Shifting journeys to public transport by increasing rural services, and promoting active travel modes such as walking and

cycling, will also be important in developing the low carbon rural economy. These should be a focus of climate action along with reducing the emissions from car travel with a switch to EVs.

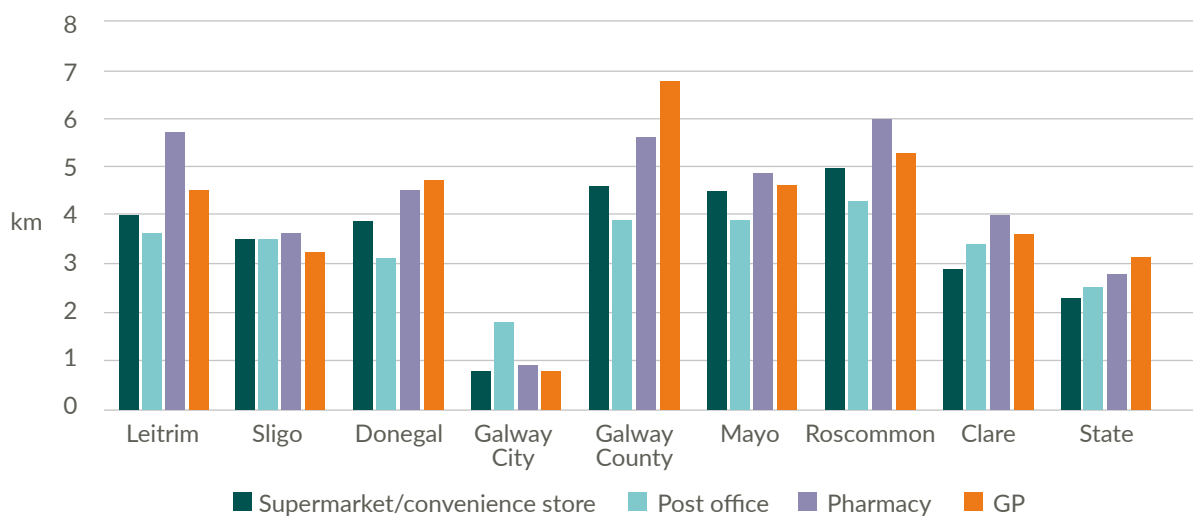
Distance to rural services and the need for rural journeys

Travelling for work and business are clearly important, but most journeys are made to reach services of varying kinds. People living in rural areas tend to be at a greater distance from services than their urban counterparts, as shown in Figure 3 below, and so the journeys made tend to be longer and more car based. Greater distance to services tends to reduce options for travel, while a lack of public transport options and the distance to public transport services increases reliance on car travel in rural areas.



Rural locations are more reliant on car transport than the rest of the country with more than 8 in 10 trips involving a car.

Figure 3: Average km distance to key everyday services for Western Region counties



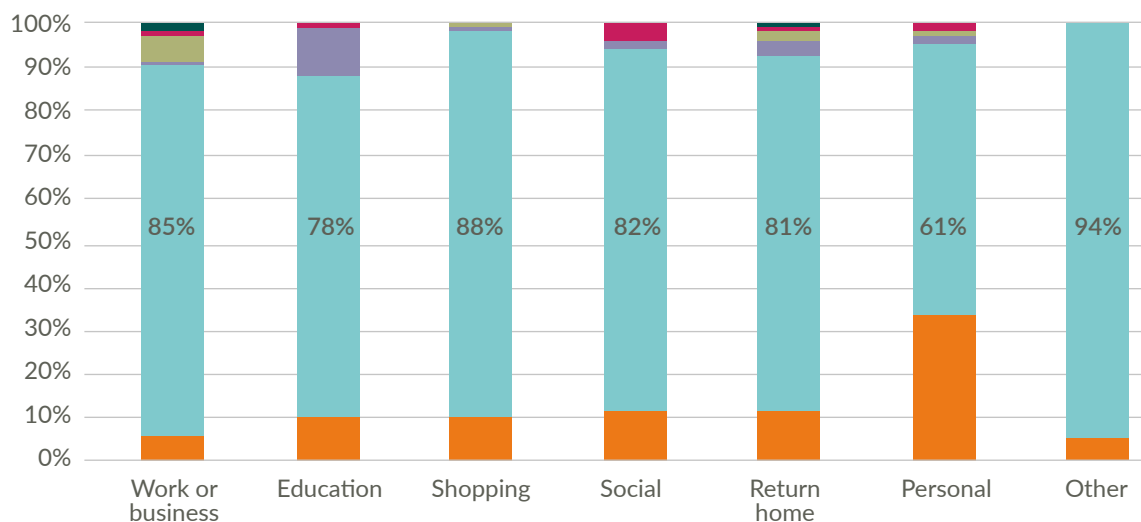
Source: CSO, 2019 www.cso.ie/en/releasesandpublications/ep/p-mdsi/measuringdistancetoeverydayservicesinireland/ Statbank Table MDS02

23 https://www.nationaltransport.ie/wp-content/uploads/2019/01/National_Household_Travel_Survey_2017_Report_-_December_2018.pdf
 24 Ibid.

The need for car travel is partly a function of the distances to be travelled but it also relates to difficulty accessing public transport. For most of these counties, these distances are greater than most people are likely to be able or wish to walk. Even where the distance to public transport services is not too great, people may be deterred by the hazards of walking on rural roads and the probability that many of the journeys in winter will not be in daylight. Even if people do walk many of these bus stops have very few services.

With the exception of Galway city all of the Western Region counties have higher levels of access to more than one car. Galway county (51.7%) and Roscommon (46.2%) most likely to have access to two or more cars. This compares to 42% for the State as a whole. Of the Western Region counties Donegal has the highest percentage with access to only one car (46.7%), which is a similar rate to Galway city (46.8%).

Figure 4: Trip purpose by mode of transport in rural areas



Source: www.nationaltransport.ie/wp-content/uploads/2019/01/National_Household_Travel_Survey_2017_Report_-_December_2018.pdf Fig 44

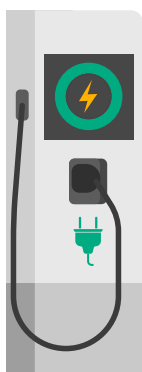
Car Travel

Car travel is particularly important in rural areas and, as would be expected, access to a car is higher in Western Region counties than for the state as a whole, with the trend generally in line with rurality. Given the difficulties of travel without a car in many parts of the region, more than one car per household is likely to be necessary, particularly if more than one member of the household works outside the home. Figure 4 below shows the dominance of car travel for all types of journeys, in rural areas, but journeys for education are more likely to involve bus transport (11% of the journeys) than other journey types.

The trend is for cleaner cars but the significant majority of vehicles licensed²⁵ for the first time (this includes new cars and imported cars which may not be new) between 2015 and 2018 were diesel (70%) and petrol (26%) while EVs only accounted for 1% (4,193 of the 820,562) of the private cars sold in that 4 year period. In 2019, however, with almost as many EVs sold (4,054) in that year as the previous four years and they accounted for 2% of private car sales. Hybrids also increased market share from 3% in the period 2015-2018 to 9% in 2019. Nonetheless almost 60% of the private cars sold were fuelled by diesel with 30% fuelled by petrol.

25 <https://www.cso.ie/en/releasesandpublications/er/vlftm/vehicleslicensedforthefirsttimedecemberandyear2019/>.

The high level of access to one or more cars is indicative of the reliance on cars for transport in rural areas. While the avoidance of travel, for example through promoting increased remote working or local retail delivery), should be a key focus of policy to reduce carbon intensity, encouraging households with more than one car to choose an EV as their second vehicle would also be useful. Given the distances many rural people regularly travel, some may feel reluctant to make the switch to an EV as a primary household vehicle, but potentially, if the second vehicle is used for shorter journeys, EVs would be more attractive. Of course, EVs are expensive, even with grant aid, and people may be cautious about second hand purchases, which puts them beyond the reach of many rural dwellers. The Programme for Government commits to using range of policy approaches to incentivise use of electric vehicles (EVs) and encourage a shift away from petrol/diesel vehicles as well as legislating to ban the registration of new fossil-fuelled cars and light vehicles from 2030 onwards and phase out diesel and petrol cars from Irish cities from 2030.



Vehicle charging investment needs to be immediate and widespread throughout the country.

To achieve government targets for EVs, vehicle charging investment needs to be immediate and widespread throughout the country. This will not just benefit those living in rural areas but will be important for those for those visiting for business or pleasure. Lack of charging points could in future become a disincentive for visitors and could further concentrate tourism and other economic activities in areas near larger urban centres. The Programme for Government commits to publishing an EV strategy to ensure that charging infrastructure stays ahead of demand and provide planning guidance to local authorities.

While there is significant policy focus on EVs, the mixing of biofuels with fossil fuels for transport under the Biofuels Obligation Scheme has significantly reduced emissions from petrol and diesel vehicles. Substituting fossil fuel with biofuel has resulted in a reduction of about half a million (553kt of CO₂eq²⁶) tonnes of CO₂eq emissions and is equivalent to 180,000 'invisible' EV's on the road. This is an important emissions reduction option. Given the likely slow transition to electric vehicles, and the life expectancy of the current car fleet (to 2030 and beyond), this scheme could be enhanced and a move to the higher E10 and B12 standards should be implemented as soon as feasible.

Remote Working

Remote working, including 'working from home' is another option for reducing journeys. Changes made in response to the Covid 19 pandemic has shown it is a viable alternative to travelling to a workplace in many situations. The pattern of home working in the Western Region and other patterns of remote and e working have been analysed in detail by the WDC. The most recent data suggest that 18% of workers declared they worked from home²⁷. There is no doubt that the practice is widespread and on the increase.

While it has been somewhat hidden from official statistics, the quality of the data is beginning to improve. The Census showed that one in ten workers in 'Highly rural/remote areas' work mainly from home²⁸. There were 94,955 who worked mainly from home, 4.8% of all people at work. The proportion of people working mainly from home was highest at 9.8% in 'Highly rural/remote areas', compared to the lowest percentage of 2.3% in 'Cities'.

The recent Remote Work Survey conducted by the WDC and NUIG in April-May 2020 received over 8,000 responses from employees across the country. It showed that 83% of all respondents would like to continue working remotely after Covid-19.

The top three advantages of working remotely cited were:

- No traffic and no commute (76%);
- Reduced costs of going to work and commuting (55%);
- Greater flexibility as to how to manage the working day (48%).

26 https://www.nora.ie/_fileupload/457-20X0088%20-%20BOS%20Annual%20Report%20for%202019%20for%20publication.pdf

27 See here for more detail <https://wdcinsights.wordpress.com/2019/11/18/e-work-remote-work-and-hubs-some-recent-evidence/>. Additional data also available in the background report.

28 CSO, 2019, Urban and Rural Life in Ireland, 2019 Table 8.2

Another aspect of e-working or remote working involves working from a hub rather than home. The success of initiatives variously called e-working spaces/ co-working spaces/ hubs also suggests e-working is on the increase. The hubs are variously classed as innovation, enterprise or community hubs, and many are focussed on start-ups and incubation spaces as well as providing e-working spaces for individual employees. The Atlantic Economic Corridor (AEC) Enterprise Hubs Project is a three-year project, coordinated by the WDC to create an interconnected community network from the 101 hubs identified as either operating or in development in the AEC region. Using hubs can reduce the distance people need to travel for work.

While remote working may be a useful tool in reducing transport demand²⁹, it may also lead to longer distances travelled, albeit less frequently, by enabling the employee to live further away from their work, but travel longer distances when they do go to the office. Along with the emissions reduction potential it has the benefit of extending labour catchments, which can improve labour supply and mobility.

Increasing the prevalence of working from home or in hubs which require shorter journeys, should be an important part of policy to reduce emissions from transport in rural areas in the future. Following the rapid increase in the practice during the Covid 19 pandemic it would be expected to be a more common option for many workers. The Programme for Government commits to developing a national remote working policy to facilitate employees in working from home, or from co-working spaces in rural areas, and to support the retention of skilled young people in rural communities.

2.2

Developing other Rural Travel options: Car Sharing, Public Transport and Active Travel

As well as reducing journey numbers there is also potential for shifting or changing the way we travel promoting car and ride sharing, public transport and active travel, in rural areas are considered in this section. To reduce the carbon intensity of rural travel we need to have a clear focus on finding solutions and piloting infrastructural investments in rural areas and small towns and trying novel approaches to encouraging sustainable travel.

Collecting real time data on travel patterns in rural towns and villages is vital to inform policy and solutions. There is scope to work with Future Mobility Campus Ireland³⁰ in Shannon where the WDC is a project partner, to develop a rural mobility testbed similar to the urban site in Shannon.

Car and Lift Sharing

Car sharing is an important option for increasing sustainable mobility. It can take the form of 'lift sharing' when a driver is already making a journey, or shared access to a car which people use as needed. Car sharing may be a useful substitute for owning a second or third vehicle, though access to the car share location may require a journey. Different models of car sharing may be in operation, some commercial (though these are less common in rural areas) and some are community based. The cars can be petrol or diesel but EVs also have significant potential in this role, with charging taking place between uses. E car sharing based in Schwarmstedt is a useful model from rural Germany³¹.

Lift sharing is a common, informal operation in many communities and among relatives, friends and acquaintances. There is significant potential for lift sharing and the co-ordination of it both locally and countrywide though specific apps (see Bla Bla Car³² for example, which is particularly popular in France³³) and through social media and apps (see the case study from Clare below).

29 Read more here: https://www.wdc.ie/wp-content/uploads/WDC_Policy-Briefing-no-7.pdf (0.5MB)

30 <https://futuremobilityireland.ie/>

31 <https://www.realweg.de/index.php?id=49> (in German)

32 <https://www.blablacar.com/>

33 read more about it here: <https://en.wikipedia.org/wiki/BlaBlaCar>

CASE STUDY

Remote working in the Western Development Commission (WDC)

The Western Development Commission (WDC) has practiced remote working (also termed e-work and telework) since it was set up in 1997. While remote working is an important tool for reducing travel and carbon emissions, when the WDC introduced remote working the goals were different.

Initially the practice was put in place to attract skilled staff from across the Western Region. The organisation has a requirement for high level, specialist skills (for example in the Investment Fund and regional analysis) and it was felt, from the outset, that teleworking would be important in recruiting and retaining skilled staff. Remote working also allows staff to live anywhere in the Western Region and so has the added benefit of enabling them to bring their insights, experience and understanding of the issues facing various parts of the Region to their work and to others in the organisation.

Communications technology has improved over the time we have been remote working, with faster broadband and better mobile coverage which have brought benefits to the work environment but the practice was efficient and effective from the outset. The WDC is proud of the progressive, innovative and highly adaptable culture that came with its early adoption of remote working practices.

“ Remote working has been hugely important in encouraging organisational efficacy, and attracting and retaining skilled staff. It has also meant that we were able to seamlessly move to full remote working when the Covid 19 crisis hit.”

Tomás Ó Síocháin,
CEO, Western Development Commission

As well as operating its own policy for over two decades, the WDC has been active in researching the practice and promoting remote working for many years. It was a member of the first e-Work Action Forum set up in 2001 and has been sharing the experience of remote working since then. In January 2020, the WDC and the Whitaker Institute, NUI Galway came together to examine the issue of Remote Work. At the outset of this collaboration, remote working was focused in particular sectors and areas, and was largely driven by talent retention, improving technology and the move to a low carbon economy. These drivers have been overtaken by the current Covid 19 crisis which has brought the issue of remote work to the fore. The objective of this collaboration is to examine issues, challenges and opportunities in extending the practice of remote working; to highlight best practice and to make proposals to inform public policy.

What emissions have we saved?

While the original objectives of the WDC's remote working policy were different, in the time it has been in place here have been significant emissions savings. For example, we calculated the emission savings for one year for staff in the organisation who worked remotely in 2018. We assumed a standard 2 days remote working per week, and included only the weeks that people were working, excluded annual leave, maternity leave and other periods where staff were not with the organisation.

We found emissions savings in 2018 from remote working in the WDC of 21.8 tonnes CO₂ eq. This is the equivalent of taking 10 cars off the road for a year which is a very significant achievement for an organisation that had 20 staff in 2018.

Read more about the Western Development Commission here: www.wdc.ie

For more formal community-based car sharing and ride sharing to work a critical number of members is crucial. Analysing supporting legal, organisational and policy frameworks for car sharing communities helps develop measures to foster the foundation of new groups.

To convince non-users to join their needs and potential motives must be understood and ways to address them be found. People may not feel comfortable in a car with a person they don't know. It seems³⁴ that social media cannot substitute face-to-face contact within communities which is often an important pre-condition for some people. Lift sharing as a driver or passenger may also be regarded as reducing flexibility. For those with no alternatives it may be a welcome option, but changing long held patterns of behaviour for others may be more difficult. Nonetheless it is not that long since hitching was a very common rural transport option.

Developing pilot models and examining what works in rural Ireland will be an important step in increasing the use of this option. The Programme for Government commits to running a pilot to examine the potential for ride-sharing apps to improve rural connectivity.



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Bus and Rail transport

While there are fewer public transport services in rural areas, and car travel is more common, the public transport system remains very important, particularly for those without access to a car, and for linking with larger towns and cities. Rail, regional bus services and the Local Link are all important options for reducing emissions.

There are significant commitments to rural transport investment in the Programme for Government including the development and implementation of a Sustainable Rural Mobility Plan³⁵. This will introduce a public transport service standard under which all settlements over a certain size in terms of population, combined with employment or education places, will have a service connecting them to the national public transport system. Local Link will play a key role in this development. This service standard is to be informed by the Connected Ireland research being carried out by the National Transport Authority (NTA). This is a very welcome development for rural transport, committing to specific levels of service should increase the take up of public transport in rural areas.

The Programme for Government also commits to prioritising public transport projects that enhance regional and rural connectivity, in line with the National Planning Framework, for additional funding in the lifetime of a reviewed and extended National Development Plan.

It is difficult to assess at the moment how the Covid 19 pandemic will change patterns of public transport use but it is likely in the short term at least, that it will reduce demand.

Rail Services

For those who live in proximity to a rail service it is an important option, especially for travel to Dublin, to cities and larger towns. The attractiveness of the rail service is dependent on the service level. While the mainline routes in the region (Dublin-Sligo; Dublin-Ballina/Westport; Dublin-Galway and Dublin-Limerick/Ennis) have reasonable frequency to Dublin, the services are not usually designed to bring people into the region early in

34 F Dorner and M Berger, 2018, Community-based mobility: a transport option for rural areas? Proceedings of 7th Transport Research Arena TRA 2018, April 16-19, 2018, Vienna, Austria

35 Programme for Government: Our Shared Future, June 2020, pg 14

CASE STUDY

Clare Local Lift— a modern approach to lift sharing

Clare Local Lift is a new rural transport initiative which uses a specially designed app to connect drivers in rural Clare to people who need a lift. In December 2019 Carrigaholt Development Association, along with Clare County Council, started piloting this community lift sharing model to serve the Loop Head peninsula.

Simple and intuitive, the Clare Local Lift app is designed to make it easy for drivers and passengers to connect. Volunteer drivers and passengers sign up and download the Clare Local Lift app from the Google Play Store. When someone needs a lift, for example to the local doctor's surgery or the shop, they put their request into the app which sends out a prepopulated message to users. A driver travelling in that direction can offer a lift. The driver and passenger then communicate through the app messaging service to confirm arrangements.

The App was developed by Arvoia, an Intelligent Mobility Solutions company based in Kerry, and funding was provided by Enterprise Ireland under the Small Business Innovation Research (SBIR) Fund. Arvoia and Clare County Council worked to bring the initiative through feasibility studies, proof of concept and on to the launch of the pilot phase.

To provide peace of mind for users, and in line with regulations, the drivers are all registered with the Taxi Regulator. As the service is free with no payments involved, this is done through Carrigaholt Development Association, an organisation with charitable status. Users can feel secure about using the service as they have information about the car, its colour and the knowledge that the drivers have been vetted. Unsurprisingly, some people still have reservations about accepting lifts from people they don't know. It is hoped that confidence will grow as the app becomes more widely used.

The pilot ran for 3 months until March 2020, so that Clare County Council and Carrigaholt Development Association could learn about what was working best and what needs to change before expanding the area covered. The Covid 19 pandemic has meant that the service is temporarily suspended as a lift app, but Arvoia repurposed the mobility app to help with getting food and supplies to isolated people in the area during the pandemic.

As travel opens up post lockdown, the options for expanding the service to other parts of Clare are being considered.

Learn more about it here: clarelocallift.clarecoco.ie/



the morning (the first train of the day arrives in Sligo at 10.15, in Ballina at 11.04 and Westport at 11.00). This also reduces the possibility for its use as a commuter service. Additionally, the pricing on the intercity service means that a trip taking 30 minutes on the intercity line is more expensive than a trip of similar duration into Dublin, (e.g. Boyle to Sligo, which takes about 36 mins costs €13.05 standard single fare while Kilcock to Dublin (on the same line) takes a similar time and costs €4.90). It is therefore considerably more expensive to travel by train than making the journey by car would be. The Programme for Government commits to reviewing fare structures to ensure that public transport is as accessible as possible, supports the delivery of services, and incentivises off-peak travel.

Bus services

Regional bus services are also important transport options, Local Link is discussed in more detail below, but the longer distance services are provided by Bus Éireann and also, significantly, by commercial operators. Bus Éireann provides a variety of services through its commercial Expressway services that are licensed by the NTA and a network of subsidised public bus services under a Direct Award contract with the NTA. The subsidised services serve many rural towns with frequencies varying from several times a day to a weekly service³⁶. The Programme for Government commits to protecting and expanding regional connectivity between towns and villages in rural Ireland.

There is a shortage of data on public transport provided by commercial operators. These account for a significant proportion of scheduled services between cities and towns in the Western Region but there is little data on passenger numbers or frequency. This can lead to underestimation of the use of public transport in the region. Integration, at least to some extent, of the timetables of the different bus operators would also be helpful to users, who may be connecting across different services.

Local Link

The Rural Transport Programme operates under the brand name Local Link³⁷ and they operate two types of bus services: Door-to-Door (demand responsive) routes and scheduled routes. Passenger journeys increased 1.76m

in 2015 to 2m in 2018³⁸, an increase of 13.6% in that period. There was a 5% increase in usage between 2017 and 2018.

The Local Link service provides public transport in places which don't have access to other services. The demand responsive, door to door services aim to meet the needs of older people, people with disabilities and others with particular transport access issues. The scheduled services are often developed following suggestion or input from potential users which means they are often important in serving a particular need (such as trips to a local town for shopping or other services). While there has been considerable growth in the service and service use there is potential for even greater uptake, especially in the context of low carbon transport. The Programme for Government recognises the importance of Local Link and in particular its potential for public transport linkages between rural areas as well as for providing the service standards to be developed. It commits to reviewing the operations and funding of Local Link within nine months and to expanding the service to three times as many passenger journeys.

The School Transport Scheme

In addition to the bus services mentioned above, the School Transport Scheme already provides a very extensive network of bus services throughout rural regions travelling from rural areas to local towns each morning and returning in the afternoon. The service is limited to use by school children, while students attending Post Leaving Cert courses (PLCs) in a town, other students, and workers or those needing to use services in the town are excluded from using it. While there are limitations to the service (it doesn't run in school holidays, and there is long time between arrival in the town and return home (but not as long as a work day)) the options for broadening this service to allow other users should be considered. The Programme for Government commits to completing the review of the School Transport Scheme to seek better outcomes and reduce car journeys. It is to be hoped that the review will also consider the potential to allow other users of the service.

36 https://www.locallink.ie/media/1351/ll_rural-transport-programme_online.pdf

37 <https://www.locallink.ie/about/>

38 <https://www.nationaltransport.ie/public-transport-services/rural-transport-programme/>

Multi Modal Journeys

Journeys by public transport are often multi modal, people need to get to a train station or bus stop by walking, cycling, driving or taking a bus. Each of these methods of access needs to be considered to increase public transport use. For example, some railway stations are a little bit outside the town they service. There should be good pedestrian access and footpaths with lighting. This is particularly important given that in the middle of winter in many parts of the Region it does not get bright until 9am and gets dark from 4.30 onwards. Likewise, to encourage cycling there needs to be secure, dry bike parking facilities. The bus service timetable should coincide with the train service, and where the railway station is at a distance from the town there should be an easy way to get there by bus, taxi or taxi share.

Similar issues can arise with access to bus stops though deterrents for use are more often related to the danger and discomfort of standing by a road waiting for a bus. The provision of physical bus stops with timetables and information would help to increase the visibility of public transport and allow people to consider the possibility of walking or cycling to the stop. The provision of simple bus shelters at bus stops would improve safety and comfort for those waiting. Such rural bus shelters are common in many parts of Europe (they are usually of different design to urban shelters) providing shelter and a place to sit. These could also be used by those waiting for a lift/car share. It would be important to include the private bus routes and stops as part of the criteria in considering the deployment of shelters.

To encourage cycling as part of multi modal journeys, it is important that secure, dry cycle parking is available, which is of good design so that bicycles may be locked without damage. In areas where there is significant commuting by public transport to urban centres there should be large cycle park facilities made available for free to incentivise cycling over car travel to the local station.

Finally, the term 'Park and Ride' should include parking at train stations or places to catch scheduled bus services. These need to be improved in many locations. Lack of safe, available parking can be a disincentive to longer public transport journeys and so should receive more investment. The service provider may need to receive targeted grant to allow for this.

Many journeys are multi modal, and yet there is very little information on such journeys with the main mode often being the only information gathered. Better data on multi modal journeys would allow for infrastructure and services to be planned taking it into account and also, with better understanding of the roles of different modes in different journey types, the more sustainable modes can be encouraged as elements of a journey.

Developing Active Travel

Active Travel (walking and cycling) brings an important range of benefits both for the traveller and for the wider community along with a reduction in travel related emissions. Discussion of active travel and increasing participation, often focuses on densely populated urban areas or on intermediate areas but it can also provide useful options for rural dwellers. There is a strong commitment to active travel in the Programme for Government.

Active travel tends to be less popular in rural areas and in small urban settlements. There are a number of reasons for this, including the need to travel longer distances to employment or services, a lack of walking and cycling facilities, motorised transport travelling at higher average speeds giving rise to concerns about personal safety, greater exposure to wind and rain, and absence of artificial lighting meaning that many journeys are difficult in the hours of darkness. The lack of congestion and more predictable car travel times also reduce the incentive to walk or cycle.

In rural areas where roads are narrow and road surfaces can be poor, walking and cycling can be unattractive options. Improvements in infrastructure can help them become part of the package of travel options for people making journey to work, school or to services. Normalising walking and cycling as viable travel options in rural areas is essential. They shouldn't be considered unusual, risky or the preserve of a small minority. This normalisation will of course occur as participation increases but also as the infrastructure for active travel is improved and the options are more visible and safer. Local authorities should examine the access roads within a 10km radius of towns to ensure they are as safe as possible for cyclists. In many situations, small changes will make the journey safer and more comfortable for cyclists, while signage will remind drivers of the need to be aware of cyclists as well

as highlighting cycling as a viable travel option. Likewise, proper pavements should be provided to link adjoining housing developments to the town.

Active travel infrastructure should not just be available in urban or congested areas but in rural and smaller towns and villages. Even where the demand does not currently appear to exist the facilities and simple safety measures should be put in place. The Programme for Government commits to allocating 10% of the total transport capital budget for cycling projects and an allocation of 10% of the total capital budget for pedestrian infrastructure. The Government's commitment to cycling and pedestrian projects will be set at 20% of the 2020 capital budget (€360 million) per year for the lifetime of the Government.

While in many situations people have no option but to drive to their local town, there should be an effort to encourage walking between shops or services within the town, leaving the car parked in one spot for the duration of the visit. Any planning for new retail or other services should require good access for walking and cycling. The

government will mandate that every local authority, with assistance from the National Transport Authority (NTA), adopts a high-quality cycling policy, carries out an assessment of their roads network and develops cycle network plans, which will be implemented with the help of a suitably qualified Cycling Officer with clear powers and roles. Local authorities should examine the access roads within a 10km radius of towns to ensure they are as safe as possible for cyclists.

Greenway developments are important and promote a positive low-carbon cycling culture, but they often have a focus as a tourist attraction and may not connect to town centres although they could function as a viable low-carbon transport mode for work, education and social activities³⁹. The Programme for Government commits to developing an integrated national network of greenways to be used by commuters, leisure cyclists and tourists.



39 See more discussion on greenways in NES's Advancing the Low-Carbon Transition in Irish Transport (p21) Research Series, Paper 13, May 2019.

2.3

Key Points and Recommendations

Key Points	Opportunities and Recommendations
Car Travel and Electric Vehicles	
<p>People living in rural areas tend to be at a greater distance from services than their urban counterparts and so the journeys they make tend to be longer and more car based.</p>	<p>Encouraging employment where people live will reduce the need for travel. Home working and hub working should form part of this.</p> <ol style="list-style-type: none"> 1. The AEC Enterprise Hubs Project will create an interconnected community network from the 101 hubs in the AEC region. The Project is coordinated by the WDC. Using hubs can reduce the distance people need to travel for work. 2. While there is a clear need to accelerate place-making and compact development set out in Ireland 2040 we also need to address the existing transport issues for people living in rural areas.
<p>The Avoid-Shift-Improve (ASI) framework should be used to plan reductions in emissions from transport, otherwise the focus tends to be on the improving how we travel (e.g. electric cars rather than diesel or petrol cars) at the expense of avoiding and shifting travel options to facilitate systemic change. In general, avoidance of use will have the biggest beneficial impacts.</p>	<ol style="list-style-type: none"> 3. Reducing the need for rural travel, for example through increased remote working and supermarket and other delivery options will help reduce reliance on cars. 4. To reduce the carbon intensity of rural travel we need to have a clear focus on finding solutions in rural areas, piloting infrastructural investments in rural areas and small towns and trying novel approaches to encouraging sustainable travel. 5. Collecting real time data on travel patterns in rural towns and villages is vital to inform policy and solutions. There is scope to work with Future Mobility Campus Ireland in Shannon where the WDC is a project partner, to develop a rural mobility testbed similar to the urban site in Shannon. 6. Encouraging households with more than one car to choose an EV as their second vehicle should be a priority. Given the distances many rural people travel, some may feel reluctant to make the switch to an EV as a primary household vehicle, but if the second vehicle is used for shorter journeys EVs could be more attractive.
<p>The transition to electric vehicles is likely to take some time, given the life expectancy of the current car fleet (to 2030 and beyond) so petrol and diesel cars will continue to be important modes of transport in the next decade..</p>	<ol style="list-style-type: none"> 7. To reduce emissions in the shorter term the Biofuels Obligation Scheme should be enhanced and a move to the higher E10 and B12 standards should be implemented as soon as feasible. This would make a significant difference even before 2030.

Key Points	Opportunities and Recommendations
Active Travel	
<p>Services such as EV charging points and CNG fuelling points must be widely available in rural areas where population is dispersed. Without these services being available, and reliable, rural dwellers could be reluctant to adopt the new technologies. Similarly, it could deter visitors who might be concerned about the availability of charging/fuelling points.</p>	<p>8. The need for, location of, and best options for developing a comprehensive charging network throughout rural Ireland should be addressed in the EV strategy outlined in the Programme for Government. This strategy is to ensure that charging infrastructure stays ahead of demand and provide planning guidance to local authorities, so it is important it addresses issues for all parts of Ireland.</p> <p>9. As noted in the chapter on electricity, there is potential for hubs and Broadband Connection Points to provide charging points for workers using them, and workspaces for people charging their vehicles. The possibility of piloting this in the AEC hubs network will be examined.</p>
<p>While EVs are one low-carbon transport solution, public transport, walking and cycling also have a role to play in rural areas.</p>	<p>10. The options for promoting these in ways tailored to the needs of rural dwellers should form a key part of the Sustainable Rural Mobility Plan committed to in the Programme for Government with clear guidance on implementation and service levels.</p> <p>11. There is a need to manage parking in towns so that those who must drive to town can leave their car parked in one spot for the duration of the visit.</p> <p>12. Any planning for new retail or other services should require good, quick access for pedestrians and cyclists.</p> <p>13. Local authorities should examine the access roads within a 10km radius of towns to ensure they are as safe as possible for cyclists.</p>
<p>Normalising walking and cycling as viable travel options in rural areas is essential. They shouldn't be considered unusual, risky or the preserve of a small minority.</p>	<p>14. Greenway developments are important and promote a positive low-carbon cycling culture, but they often have a focus as a tourist attraction and may not connect to town centres. They should connect to town and village centres and be designed to function as a viable low-carbon transport network for commuting.</p>
<p>The Programme for Government commits to allocating 10% of the total transport capital budget for cycling projects and an allocation of 10% of the total capital budget for pedestrian infrastructure</p>	<p>15. This commitment to cycling and pedestrian projects will be set at 20% of the 2020 capital budget (€360 million) per year for the lifetime of the Government and is very welcome. It is essential that this budget also benefits rural areas and is used to fund rural and small town walking and cycling travel initiatives including the focus on cycling within a 10km radius of towns (see above).</p>

Key Points	Opportunities and Recommendations
Car Sharing and Public Transport	
<p>Car sharing may be a useful substitute for owning a second or third vehicle. Lift sharing is another option reducing the overall number of journeys being made.</p>	<p>16. Developing practical pilot models for these and examining what works in rural Ireland will be an important step in increasing the use of this option.</p> <p>17. Following the Clare Lift Sharing pilot, the opportunities for expanding the use of the lift sharing app that has been developed, should be considered. Initially it may be important to pilot its use in various types of rural areas to determine the places where it is most likely to be a real transport alternative.</p> <p>18. The potential for a rural car sharing scheme in some villages, using EVs, should be explored as a pilot.</p>
<p>To improve public transport and improve uptake the level and timing of rail services is important.</p>	<p>19. In order to allow the use of mainline rail for commuting to work it is important that services arrive into Sligo, Westport and Ballina at times which allow it to be used for commuting to work.</p> <p>20. Fares need to be competitive for shorter journeys on the mainline rail to encourage travel between regional cities and towns by rail.</p> <p>21. Rural commuters using the main line service should be able to avail of the Tax saver incentive to use public transport to and from work. In the Western Region it is currently only available on services between Athenry and Galway.</p>
<p>There is a shortage of data on public transport provided by commercial bus operators. These account for a significant proportion of scheduled bus services between cities and towns in the Western Region but there is little data on passenger numbers or frequency.</p>	<p>22. Data on private bus services and passenger numbers should be collected in a similar way to that for Irish Rail and Bus Eireann.</p> <p>23. Integration, where possible, of the timetables of the different bus operators would be helpful to users, who may be connecting across different services.</p> <p>24. Where a bus service exists bus stops or covered bus shelters, signage and information should be available.</p> <p>25. An Information app on availability/ and real time arrival should be developed to ensure that real time data is available on rural transport. This is a greater need in rural areas where public transport is less frequent.</p>

Key Points	Opportunities and Recommendations
Car Sharing and Public Transport	
<p>There is considerable potential for increased use of the Local Link rural transport service, particularly among those who do not have access to a car and may currently need to be driven.</p>	<p>26. Promoting the existing services in their catchment areas and developing suitable timetables in consultation with potential users would help increase service use, along with the availability of real time data and user apps.</p> <p>27. Along with the development of the Local Link service, the Programme for Government commits to developing a subsidised Local Area Hackney Scheme. The scheme is to be informed by the National Transport Authority Local Area Hackney Service Pilot Programme which is underway in 15 designated areas of rural Ireland, which are too small or remote to support a full-time taxi or hackney service. This is likely to be important in supplementing public transport or providing transport services where none exist.</p>

3

Energy Efficiency and Heating in Western Region Homes



Reducing emissions from our homes will be one of the most important elements of the Western Region transition to a low carbon rural region. To do this we need to improve energy efficiency and switch to renewable energy sources for heating. In this section what we know about homes in the Western Region and the changes that are needed are examined.

The built environment accounts for more than 12% of Ireland's greenhouse gas emissions, and more than a quarter of energy related carbon emissions come from Ireland's homes⁴⁰, so increasing efficiency in our homes and changing the way we heat our buildings will both be significant climate actions. The way buildings are heated has important rural dimensions. Homes in rural areas are more likely to use oil boilers or rely on solid fuel, including peat, which is a significant source of heat energy in some Western Region counties.

Increasing energy efficiency is covered in detail in the Climate Action Plan with a focus on the energy standards for new build, energy efficiency rating in homes and other buildings, regulation⁴¹ and retrofitting to improve energy efficiency⁴². For homes, the focus in the Climate Action Plan is largely on the installation of heat pumps and the government set very ambitious targets for improving energy efficiency including retrofitting 500,000 buildings to a much higher level of efficiency (BER B2) and moving to more renewable heat sources with a target to install 600,000 heat pumps (of which 400,000 will be in existing buildings). The new Programme for Government provides more information on how this will be achieved.

Home Energy Efficiency in the Programme for Government

The Programme for Government commits to publishing a National Retrofitting Plan (pg 21) as part of the National Economic Plan which will:

- Develop a new area-based and one-stop-shop approach to retrofitting, to upgrade at least 500,000 homes to a B2 by 2030.
- Group homes together to lower cost, starting in the Midlands area.

- Leverage smart finance (e.g. loan guarantee, European Investment Bank, Strategic Banking Corporation of Ireland (SBCI)).
- Develop easy-payback mechanisms (i.e. through utility bills).

The government will provide €5 billion from the Climate Action Fund (raised from Carbon Taxes) to part fund a socially progressive national retrofitting programme targeting all homes but with a particular emphasis on the Midlands region and on social and low-income tenancies (pg 24). It will examine the development of green mortgages and financial products to assist in the upgrade and retrofit of energy efficient homes (pg 25).

The Sustainable Energy Communities (SEC) programme run by the Sustainable Energy Authority of Ireland (SEAI) will also have a significant role in relation to reducing emissions from homes, first by assessing energy use in the local energy Masterplan, and then co-ordinating the retrofit and improved efficiency in targeted homes in the community and where appropriate, changing the heating methods. The SECs are discussed in more detail in the next chapter.

In this section energy efficiency and heating in Western Region homes is considered. Much can be changed between now and 2050. For example, in 2010 the average existing dwelling used around 22,500 kWh and emitted around 7.5 tonnes CO₂, by 2050, the average energy demand per dwelling could be reduced by 60% to 65% (to 8000 - 9000 kWh) as a result of energy efficiency improvements for space and water heating, reductions in lighting and appliance electricity consumption⁴³. The impact on average dwelling CO₂ would be greater (estimated to be between 500 and 2,500 tonnes CO₂ by 2050 depending on the rate of change), due to both the decarbonisation of the electricity grid and a switch to cleaner fuels.

40 In 2018, residential sector energy-related CO₂ emissions (including upstream electricity emissions) were 9,114 kt CO₂, representing 24% of the total energy-related CO₂ emissions.

41 Action 60 and 61 on oil and gas boilers

42 See for example Actions 43-51

43 <https://www.seai.ie/publications/Residential-Energy-Roadmap.pdf>

Most of the homes in Ireland today will still be occupied in 2050 so our decisions have long term impacts. Knowing the current situation means that we can make better decisions about what we need to do to make the transition possible and ways to make it happen. To understand the challenge it useful to look at homes in the seven county Western Region and how we heat them. There is more detailed data and discussion in the background report⁴⁴.



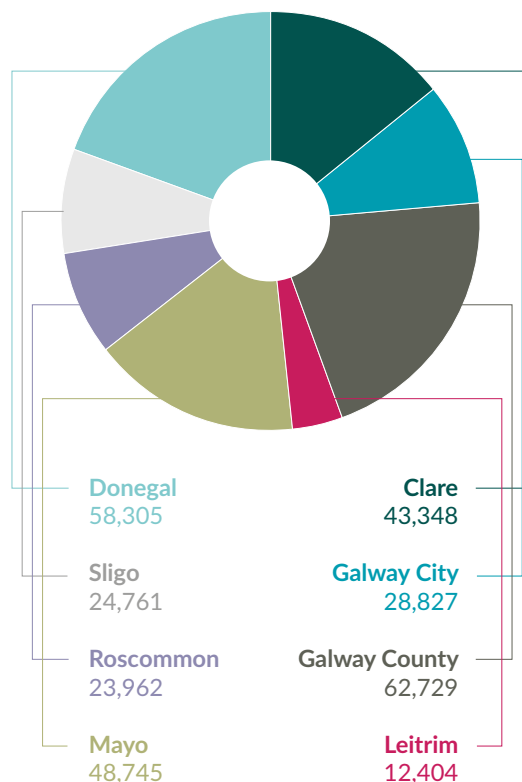
Most of the homes in Ireland today will still be occupied in 2050 so our decisions have long term impacts

3.1

What kinds of Homes are in the Western Region?

According to Census 2016 there were 303,081 'permanent housing units' in the Region⁴⁵. The Western Region, in 2016, accounted for 18% of the permanent homes in Ireland which is in line with the share of the population living in the Region (17.4%). In the Western Region (see Fig 5), Galway had the largest number of homes (91,556) while Leitrim, the smallest Western Region county, had 12,404 homes.

Figure 5: Permanent homes by county in the Western Region, 2016



Source: CSO Census of Population 2016, Profile 1: Housing in Ireland Table E1002

Types of Homes

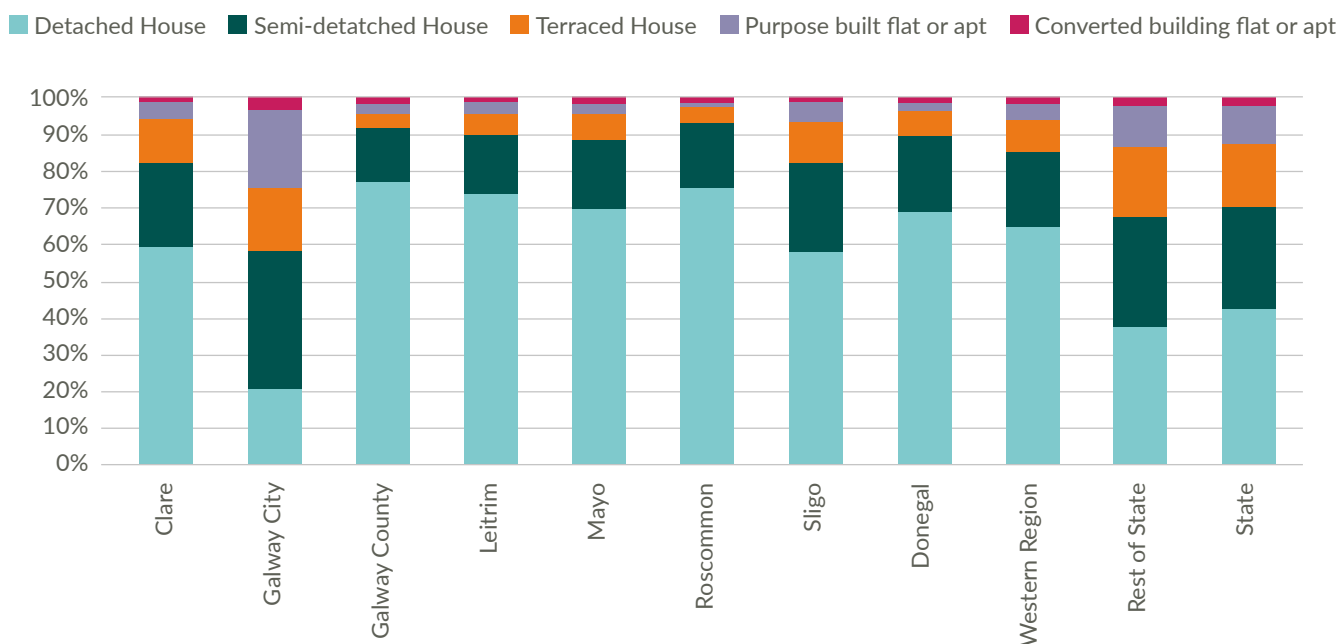
Different types of homes have different levels of energy efficiency and different options for improving energy efficiency and switching to more renewable energy sources for heat. For example, terraced houses will have lower heat loss than detached houses, while flats and apartments are more suited to shared or district heating systems than dispersed housing.

Detached houses are the most common housing type in the Western Region, accounting for 64% of all homes in the Region compared to 37% of homes in the rest of the state (See Fig 6). As would be expected the more rural counties have an even higher proportion of detached homes (Leitrim 73%, Roscommon 74%). Counties with a higher urban population have a smaller proportion of detached homes (Clare 59%, Sligo 57%) but all are still above the state average (42%). Galway city is the exception with 20% homes detached.

⁴⁴ This is available at www.wdc.ie/publications

⁴⁵ While newer homes have been built since the Census in 2016, the numbers are relatively small and as building regulations are much stronger these homes are not the focus of the efficiency and energy upgrades envisaged in the Climate Action Plan and through SEAI supports.

Figure 6: Type of permanent housing units in the Western Region, 2016



Source: CSO Census of Population, Profile 1: Housing in Ireland Table E1002

Age of Homes

The age of homes in the Region is also important to planning the transition. There was significant house building in all counties between 2001 and 2010, with more about a third of homes in Galway County (32%), Leitrim (35%), Roscommon (31%) and Donegal (31%) built in that period. Other Western Region counties also have a higher proportion of homes built in that period than the rest of the state (25%). Energy efficiency upgrades will be easier and cheaper for homes built in this period. Older homes will have different requirements and are likely to face greater costs and challenges. More than a quarter of homes in Leitrim (26%) were built before 1960 while only 17% of those in Donegal were. In Galway City only 10% of homes were built before 1960. The oldest homes will often face the most significant challenges, though it should also be recognised that they are not necessarily the least efficient.

While newly constructed buildings have significant potential to incorporate the reduction or elimination of energy consumption for heating into their design, a focus on improving existing buildings is essential. The longevity of buildings and the building stock (typically at least 50–100 years) means that for a very long time ahead the

majority of the building stock will be from an era with less stringent energy efficiency regulations.

Continued improvement in building standards and regulations mean that it is generally assumed that homes built after 2010 will require least upgrading and therefore the focus for retrofitting is likely to be on homes built before 2011. In the Western Region there are 280,949 homes built before 2011, so 93% of all the homes in the Western Region⁴⁶ are likely to require some form of energy efficiency upgrades and fuel switching to complete a move to a low carbon economy.

93%

of all the homes in the Western Region are likely to require some form of energy efficiency upgrades and fuel switching to complete a move to a low carbon economy.

46 CSO Census of Population 2016; excludes 'not stated'

Nearly Zero Energy Buildings (NZEB)

The revised building regulations that apply to all new dwellings commencing construction from 1st November 2019 aim to make all new residential dwellings 70% more energy efficient than the performance requirements in 2005. The regulations bring the EU's 2010 Energy Performance of Buildings Directive into Irish law. The directive requires member states to ensure that all new homes are Nearly Zero Energy Buildings (NZEB) by the 31st December 2020, whilst also tackling the existing housing stock.

The new regulations require that 20% of the total energy use of buildings is sourced from renewables. In addition, where major renovations (defined as a renovation where more than 25% of the surface envelope of the building undergoes renovation) are carried on a building, the whole building or dwelling should achieve a cost optimal energy performance insofar as it is technically, functionally and economically feasible. The cost optimal energy performance level for a typical dwelling is equivalent to a B2 BER.

What will it mean?

A typical 3-bedroom semi-detached house built between 1994 and 2004 is likely to be C rated. A similar 3-bedroom semi-detached house built under the new regulations will be A2 rated and will cost approximately €400 a year to heat. It will probably have heating and hot water costs that are only a quarter or a third of a similar house built in 2005.

Read more:

<https://rebuildingireland.ie/news/minister-english-reminds-construction-sector-to-be-prepared-for-new-building-regulations-on-energy-efficiency/>

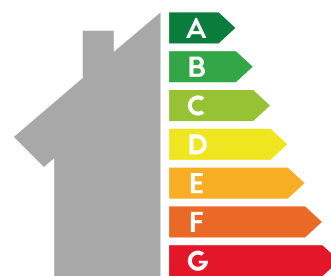
<https://www.housing.gov.ie/housing/building-standards/energy-performance-buildings/new-energy-efficiency-standards-new>

How Energy Efficient are Western Region Homes?

A Building Energy Rating (BER)⁴⁷ certificate indicates a building's energy performance rates on a scale of A to G. A-rated homes are the most energy efficient and G-rated are the least energy efficient. The Climate Action Plan and Programme for Government focus is on improving homes to a BER rating of at least B2. Currently in the Western Region only 5% of homes with a BER rating achieve B2 and above (Fig 7). Galway city and Galway county (6%) perform best, followed by Mayo and Sligo with 5% of homes while only 3% in Leitrim and Roscommon have a rating of at least B2. In contrast 9% of dwellings nationally achieve B2 and above.

While the BER data is very useful for highlighting where upgrades will be required, in many areas less than quarter of homes have had a BER assessment. The CSO indicates that for dwellings with a BER, there are fewer in the lower rating categories than might be the case if all dwellings were included, while there are more dwellings in the higher rating categories than might have been expected. It seems that dwellings which have had a BER assessment are performing slightly better than if all dwellings were rated.

With only 5% of Western Region homes achieving a BER rating of B2 and higher it means that almost 267,000 homes would need to be retrofitted (perhaps more if ratings have tended to be on more efficient homes). The challenge to improve energy efficiency through retrofit is, therefore, very significant. Homes in the Western Region need to be prioritised for retrofit.

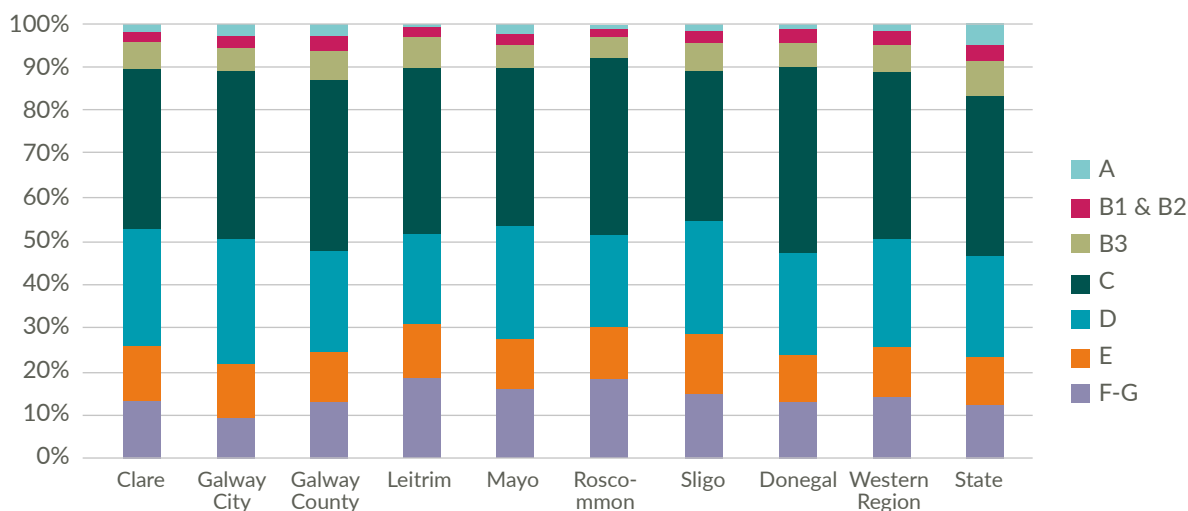


5%

Only 5% of homes in the Western Region with a BER rating achieve B2 and above

⁴⁷ See more on the Building Energy Rating (BER) <https://www.seai.ie/home-energy/building-energy-rating-ber/>

Figure 7: Percentage of rated buildings in each BER class for Western Region counties



Source: CSO, 2020, Domestic Building Energy Rating Table EBA02

What is retrofit?

An energy efficiency retrofit involves making modifications to an existing building to improve energy efficiency or decrease energy demand. Retrofits are often referred to as 'shallow' or 'deep'.

Shallow retrofit may include cavity wall insulation, window replacement, attic insulation, draught proofing, energy efficient lighting and improved heating controls, and these may be done one at a time and not as part of a complete plan.

In contrast, the Deep retrofit of a home means carrying out multiple energy upgrades all at once to achieve a BER of A-rating. The SEAI provides the following information on Deep Retrofit⁴⁸:

- The first step is to reduce the level of heat loss so that heat is kept in the home for longer. This involves some or all of the following: wall insulation, roof insulation, floor insulation, window upgrades.
- The next step is to look at an efficient renewable heating system to support the transition away from fossil fuels. The typical heating system installed on a Deep Retrofit Pilot Project is an air-source heat pump.
- It also includes mechanical ventilation to maintain good indoor air quality.
- Other renewable energy technologies such as solar water heating panels and solar photovoltaic panels may be installed as appropriate.

The government target to bring 500,000 homes to a BER B2 equivalent does not specify the kind of retrofit required, but it is likely to be closer to a 'deep' retrofit approach (although not to an A rating but to a B2), particularly as a proposal is to be developed to phase out grants for 'shallow' energy efficiency measures by 2022 (Action 52)⁴⁸.

48 <https://www.seai.ie/grants/home-energy-grants/deep-retrofit-grant/>

49 <https://www.dccae.gov.ie/documents/Climate%20Action%20Plan%202019%20-%20Annex%20of%20Actions.pdf>

How much will the householder save?

Improving the energy efficiency of the home through retrofit should provide energy savings, the larger the move up the BER scale the larger the savings. The SEAI has provided an indication of energy costs for different house types at different BER ratings an owner of an F rated '3 Bed Semi Detached House' could save €2,400 in energy costs a year, while an F rated 'Large House' could save €7,200 annually following retrofit.

It should be noted in relation to potential savings, that energy cost estimates usually refer to heating a whole house to 'a comfortable level'. It has been found that people living in less efficient homes may not be heating the house to that level, while those in more efficient, upgraded homes may heat their home more. Therefore, upgraded homes may not be achieving the savings estimated as people's everyday practices and norms of comfort are often changed in parallel to retrofitting of the home⁵⁰. In addition, the recent falls in oils prices mean that savings will be less than predicted and payback periods longer than predicted, particularly for homes heated with oil. Payback periods are also likely to increase as a result of the recent fall in oil prices.

How much does retrofit cost?

It is difficult to find generalised cost estimates for deep retrofitting given the significant variation among house types, size and the upgrades required, but it is usually agreed that it is very expensive. The SEAI found that for 250 homes that completed deep retrofits under SEAI's pilot programme the average cost to upgrade a home from an average BER rating of F rating to an average A3 rating was €48,417. SuperHomes (a retrofit service providing a 'one stop shop' for energy retrofit projects) suggests that the typical cost of a full scale deep retrofit to BER A3 standard in 2019 was between €50,000 and €70,000 (before grants). This includes a heating system (discussed further below). With grant funding, which was available at the time, the net spend was typically between €30,000 and €45,000.

The government retrofit target is a B2 energy rating, rather than the A3 ratings being achieved above so the cost should be somewhat less. It is not clear how much less, as data on costs to achieve a B2 rating do not seem

to be available. Overall costs of achieving the target will, of course, depend on the type and size of houses which are being retrofitted. This in turn will partially depend on the incentives available.

When compared to the value of homes in Western Region the cost of the deep retrofit could be equivalent to a large proportion of the home value. While in more expensive areas the cost of the upgrade may account for less than 10-15% of the home's value, it could be more than double that in counties like Leitrim and Roscommon where house prices are lower.

The Programme for Government commits to using resources from the National Recovery Fund to immediately finance local authority retrofit programmes and to offer grants to owners of private properties. This effort will initially be focused on the Midlands, where dependence on fossil fuel is greatest. Given the reliance on oil as well as coal and peat in the Western Region it should be included in the first stage along with the Midlands.

The Climate Action Plan calculated that retrofitting homes which currently have oil boilers would create a national economic benefit in terms of euros per tonne of CO₂ saved⁵¹ while retrofitting homes currently fitted with gas boilers and solid fuels stoves would have national economic costs in terms of euros per tonne of CO₂ saved⁵². These retrofit cost calculations include wall, roof and window insulation but exclude boiler upgrade. Switching from oil boilers to heat pumps in existing dwellings would increase the costs. The recent fall in oil prices is likely to have changed payback periods for retrofit and economic benefit calculations significantly.

50 Kirsten Gram-Hanssen, 2014, Retrofitting owner-occupied housing: remember the people. <https://www.tandfonline.com/doi/full/10.1080/09613218.2014.911572>

51 Marginal Abatement Cost Curve for Ireland to 2030, Fig 4.2 Climate Action Plan

52 It concluded this, and the switch from oil boilers to heat pumps, would be worthwhile to meet the Non ETS and 70% RES E targets.

CASE STUDY

EcoSmart— a local energy efficiency enterprise

EcoSmart External Insulation Ltd, based in Castlereagh, Co. Roscommon, is an innovative insulation company, specialising in external wall insulation and providing energy saving solutions services throughout Ireland. The company offers a variety of energy efficient building solutions and modern build technology. They assess each building and offer professional advice on the energy efficiency options, grants available and compliance with the required building regulations.

Patrick Lavin and Adam Dybkowski founded EcoSmart External Insulation in 2013, both had previously worked on energy efficiency projects including those funded by the Green Deal Scheme in the UK. In 2017, EcoSmart was a partner in a Better Energy Community scheme in their region and they continue to share their learning and expertise with communities.

“ With our ability, experience and ambition there is no project too big or too small for us to cater for. All our insulation specialists are highly skilled and experienced in the installation of our complete range of products.”

Pat Lavin, EcoSmart

EcoSmart fits external insulation to homes and buildings of all kinds. The thermal insulation is fixed to the external wall followed by reinforced layer and then a render coating. It can be applied on new or existing external surfaces of any kind of building.

In 2015, they won the contract, which was one biggest in Ireland, for external insulation in Roscommon County Councils new offices. They have a comprehensive quality assurance management system in place and they feel that this made a difference in their tender and was a major factor in winning the contract.

There are important opportunities for the company ahead. The focus on transitioning to a low carbon society and changes to building regulations and standards are driving demand for energy efficiency in construction projects, both new projects and retrofitting of older buildings.

“ Having operated through a period of growth, recession and growth again, we learned the importance of planning and business development, including putting a robust quality assurance system in place and recruiting specialists to undertake specific roles within the company.”

Pat Lavin

The development of the ‘Sustainable Energy Community’ (SEC) Network, and the Climate Action Plan target of having 500 SECs operating in every part of the country by the end of 2020 and 1,500 by 2030, will also provide increased opportunities in this area.

Read more about EcoSmart External Insulation here: <https://ecosmart.ie/>



The Programme for Government outlines how it will deliver on the retrofitting ambition by:

- Designating a National Retrofitting Delivery Body by the end of 2020.
- In addition to the current scheme, using resources from the National Recovery Fund to immediately finance Local Authority retrofit programmes and to offer grants to owners of private properties. This effort will initially be focused on the Midlands, where dependence on fossil fuel is greatest.
- Commencing pilot schemes in early 2021, to test key elements of the national plan, building on the work being started in the Midlands. Following evaluation of the pilots, we will roll out our National Retrofitting Scheme.
- Overhauling existing apprenticeships, traineeships and education programmes in the short term and launch a significant effort to upskill the existing workforce for new technologies and building methods (e.g. heat pumps).

The government will work with the Strategic Banking Corporation of Ireland to develop funding options to deliver retrofitting with suitable retail partners, such as An Post and the Credit Unions. It will:

- Establish a loan guarantee scheme to support access to finance for retrofitting.
- Amend the Energy Efficiency Obligation Scheme to boost the supply of retrofits, by increasing the targets which obligated parties must deliver, including for domestic homes and those in energy poverty.
- Take steps to increase the number of homes and businesses with Building Energy Ratings (BER) and Display Energy Certificates (DEC), and use this data to increase the number of home and business retrofits being carried out.

The plan aims to grow the existing retrofit industry tenfold and provide opportunities that the SME sector can take advantage of and to give enterprise the confidence to set up supply chains, train staff and invest in the required equipment.

Meeting the high-level target to complete half a million retrofits is a challenge but it should have important benefits in rural areas, both in terms of improving energy efficiency and comfort and heat for many rural dwellers, and for up skilling and employment throughout the country. The issues of financing and cost have yet to be addressed in detail. It is important that annual targets are put in place to ensure stepwise achievement of the targets.

The full suite of mechanisms to be used to achieve the government retrofitting target have not been finalised, but it is clear that it is ambitious. The Programme for Government commits to providing €5 billion to part fund a socially progressive national retrofitting programme targeting all homes, with a particular emphasis on the Midlands region and on social and low-income tenancies. It will be funded from the carbon tax.

The cost of retrofits, the means of paying for such energy efficiency, the incentives which will be provided are being investigated. There are a huge range of issues to be considered when deciding how we should best reduce our emissions for the built environment. It is important that

particular issues and incentives for homes in rural regions and the Western Region are considered by the National Retrofit body to be designated by the end of 2020 (as outlined in the Programme for Government), while the focus on the Midlands should lead to learnings for the more rural Western Region. Under the work of the Just Transition Commissioner, there are 150 properties in each of the five Midlands Local Authorities which have been surveyed for deep retrofit and which is expected to be completed by the end of the 2020⁵³. When these are complete we should have more knowledge of the costs involved. As noted above the SECs will also have a significant role to play in improving building stock and heating for communities.

53 https://www.dccae.gov.ie/documents/Just_Transition_Progress_Report.pdf

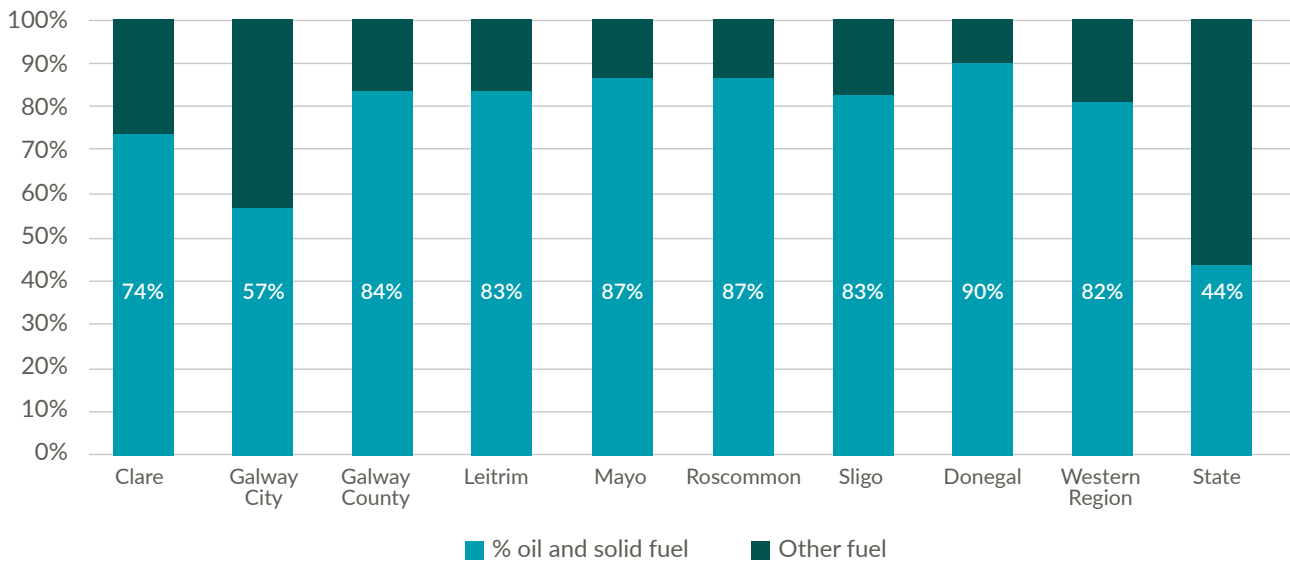
3.2

How do we heat our homes?

The fuels we use to heat our homes directly affects emissions and changing the fuel used for heating will be necessary to reduce our carbon foot print. We will need to decarbonise the fuels used by switching to renewable energy. This may be electrical (generated from wind, solar or, in future, ocean energy), or bioenergy e.g. wood energy, biogas from anaerobic digestion or a liquid biofuel.

While the focus of government policy in the Climate Action Plan and the Programme for Government⁵⁴ is on heat pump installation, along with retrofit, (there is a plan to install 600,000 heat pumps by 2030), this is likely to be most appropriate, though still difficult, for homes heated using oil. Almost 60% of homes in the Western Region use oil for central heating compared to 36% in the rest of the state. The Programme for Government commits to commencing a targeted programme to install heat pumps in homes that are already suitable for the technology, as part of the plan to install 600,000 heat pumps by 2030.

Figure 8: Oil and solid fuel as a percentage of central heating fuels in Western Region counties



Source: CSO Census of Population, Profile 1: Housing in Ireland Table E1053

The highest priorities for change are buildings heated using the most carbon intensive fuels (oil, coal and peat). Homes in the Western Region are particularly reliant on these, being rural, with little access to the natural gas grid and often using very traditional forms of central heating. In the Western Region more than 80% of homes use oil, coal or peat for central heating, compared with 44% of homes in the rest of the state (Fig 8). In Donegal 90% homes use these fuels, with Mayo and Roscommon almost as high (each 87%). Clearly homes in Western Region counties need to be prioritised in the switch to low carbon heating.

In homes heated using coal and peat a switch to other renewable solid biomass such as wood energy (pellets or logs) might be more appropriate. This is especially in older homes which will need very significant retrofitting and may have particular ventilation requirements.

60%

Almost 60% of homes in the Western Region use oil for central heating compared to 36% in the rest of the state

54 <https://www.dccae.gov.ie/en-ie/climate-action/topics/climate-action-plan/Pages/climate-action.aspx>

What can we do to reduce emissions from our homes?

The first step in reducing emissions from our homes is, as discussed, to make them more energy efficient, so that we use less energy to heat them and less heat is lost to the outside atmosphere. This is why improved insulation and reduced draughts, achieved through both deep and shallow retrofit, are so important.

Heat Pump Ready?

In order for heat pumps, which produce low temperature heat, to function efficiently and effectively they should only be fitted in very energy efficient homes. In 2019 SEAI used Heat Loss Indicator (HLI) data from BER certifications⁵⁵ to assess how many homes built prior to 2010 are ready to have heat pumps installed. Using the more stringent measure (HLI ≤ 2 W/K/m²), a similar percentage of homes in the Western Region (11.7%) as in the rest of the State (12.8%) are ready. In the Western Region Sligo has county with the highest proportion of heat pump ready homes (15.6%) followed by Galway (14.0%) and Leitrim (12.6%). Roscommon (8.6%) and Mayo (9.3%) have the lowest number of homes ready for heat pumps.

Using a less stringent measure (HLI of ≤ 2.3) there are a considerably higher proportion of heat pump ready homes in the Western Region (23.2%)⁵⁶ which is higher than the

rest of the State (22.5%). Again, Sligo has the most heat pump ready homes (27.8%) with Galway (23.9%), Leitrim (24.1%) and Clare 23.9% all higher than the Region average. The lowest proportion of homes ready for a heat pump is in Roscommon (18%) and Mayo (19.4%).

Although only 23% of homes are currently heat pump ready in the Western Region this still amounts to 65,187 homes in total in the region (and 351,295 in total for the state). While not directly equivalent, these homes are likely to have achieved a BER rating of C and above. Prioritising these homes will make a very significant start on meeting the target in the Climate Action Plan.

Other renewable heat

The focus of the Climate Action Plan is on improved energy efficiency and a switch to heat pumps. While energy efficiency is important, deep retrofitting is very costly and can be complex in a non-standard home. In many situations a shallow retrofit, addressing the most important energy efficiency issues may be the best option. This, along with a direct renewable energy source of heat such as pellet or log boilers may be the most suitable low carbon options in many rural homes which have space for fuel storage and could have local access to the resource without significant transport costs.

Wood Heating for Rural Homes

Where homes are hard to retrofit—because of their age, building fabric or for cost reasons— and so are not suitable for a heat pump, wood fuel is an important alternative heating option. As it produces high temperature heat it is particularly suited to those homes where deep retrofit is not a viable option.

It is important, however, that wood fuel is used correctly in appropriately designed boilers and stoves. The wood used should have a low moisture content (less than 20%) so it must have been correctly seasoned or dried. This will both improve the energy efficiency of the fuel and will also significantly reduce the level of particulate emissions. Wood fuel should be from forest by products, creating a value for thinnings and for brash or parts of the trees which do not have other commercial value. The wood fuel should be sourced from a Wood Fuel Quality Assured (WFQA)⁵⁷ or other approved supplier and stored in a dry place. The Irish Bioenergy Association (IrBEA)⁵⁸ has proposed a statutory upper limit of 20% on the moisture content of firewood offered for sale, with a limit of 25% for an initial two year phase.

Stoves and boilers have become increasingly efficient and any new installations must meet Eco Design standards. The EU regulations for Eco Design define the minimum requirements that products running on solid fuel used for heating purposes must comply with relating to energy efficiency and particulate emissions (PM), organic gaseous compounds (OGC), carbon monoxide (CO) and nitrogen oxides (NO_x).

55 <https://www.seai.ie/blog/opportunities-for-heat-pu/>

56 This figure includes all those homes with a HLI of ≤ 2.0

57 Wood Fuel Quality Assured (WFQA) <https://www.wfqa.org/>

58 <https://www.irbea.org/irbea-meet-epa-proposal-regulate-moisture-content-firewood-sale-ireland/>

Rural homes in most parts of Ireland are close to a local supply and won't have significant fuel transport costs. Most homes are detached and have larger gardens than in urban areas so bulk storage of fuel is feasible. Log or pellets are most likely to be suitable (wood chip is more likely to be appropriate in commercial settings) and can also be used as an auxiliary heat option in stoves.

Wood as a sustainable fuel

Wood, both in its raw and processed form, can be considered a sustainable fuel. The combustion of wood releases carbon dioxide; this emission is the carbon which the tree has collected and stored over its lifetime. It is important that wood fuel is only obtained from sustainable sources, to ensure that carbon is recaptured at a landscape level and the circle of emissions and capture remains unbroken.

It is also important that the fuel is either a forest or wood processing by-product, giving a value to what otherwise would remain unharvested (thinning- which when taken allows remaining trees to increase in size) or as a waste product (by-products of harvest or sawmilling).

The WDC has been active in developing measures to promote the use of energy (in particular heat) from biomass, assessing biomass availability and the development of supply chains for its local use. The renewable heat market has the potential to create considerable levels of employment across the Western Region and to provide long-term stable markets for low value wood fuels which can compete with fossil fuels and stabilise energy prices for end users⁵⁹. Bioenergy brings local jobs, benefits local businesses, helps local economies and replaces imported fuels so it provides important opportunities for rural and remote areas.

There is significant future potential for renewable heat in rural areas, but rural dwellers may lack the financial resources to switch to low carbon or carbon free alternatives. In the shorter term it could be useful to consider introducing a biofuels obligation scheme for heating fuels, requiring the addition of biofuels to kerosene for use in home heating. There are some technical problems to be addressed but this has been an effective means of reducing the carbon intensity of transport fuels. Similarly the addition of biogas to the natural gas used in the gas network will also have benefits, although, as we have seen, relatively few homes in the Western Region are heated using natural gas.

District Heating

There is also potential for developing district heating in towns in the Western Region. With district heating the heat is generated centrally and supplied as hot water

to homes and other buildings through a district heating network. It is more energy efficient to generate the heat centrally, and a variety of renewable fuels may be used (including biomass and biogas). Homes are metered and they pay for the heat used. It is a common heating solution throughout Europe and while it has not been used much in Ireland⁶⁰ it is being installed in Dublin sites and there are also several examples of local community heating schemes in smaller towns and rural locations in Ireland including in the rural village of Cloughjordan. The Programme for Government commits to learning from existing district heating pilot projects to launch a scaled-up programme and to developing a regulatory environment to support the development of district heating. The government is also committed to publishing a feasibility study on establishing a district heating authority and setting new targets for district heating as part of a new strategy.

While population density and scale of heat demand are important for viable district heating projects, which require capital intensive investment in the network, the options should be explored further in rural towns in the Western Region. Previous work by the WDC⁶¹ examined some of the options and potential for district heating in rural towns (including Belmullet, Carrick on Shannon and Roscommon). The Claremorris and Western District Energy Co-op (see case study in the next chapter) has recently completed a feasibility study on a district heat network for Claremorris.

59 <https://www.biopad.eu/wp-content/uploads/Local-Economic-and-Social-Benefits-summary-final-23.09.14.pdf>

60 For more discussion of district heating in Ireland see https://www.seai.ie/publications/2016_RDD_79_Guide_District_Heating_Irl_-_CODEMA.pdf

61 <http://www.raslres.eu/wp-content/uploads/2011/06/RASLRES-District-Heating-Public-Sector-WR.pdf>

CASE STUDY

Supplying renewable energy locally— McCauley Wood Fuels

Based near Mohill in Co. Leitrim, McCauley Wood Fuels is a family owned business and a leading biomass and local wood fuel supplier. The business is operated by Kenny McCauley and his father Brian. It began in 2008, evolving from their landscaping business, and has since matured into a significant enterprise. With ongoing investment in production and equipment they have continued to grow the business.

Over the past three years they have increased production of biomass from 2,500 to over 10,000 tonnes per year. This is enough locally grown biomass to displace about 4 million litres of fossil fuel oil per year. With a current capacity for over 40,000 tonnes per year, they are confident in their position to meet a growing demand for sustainable and locally produced biomass and wood fuels into the future.

“ We are delighted to be able to use the local forest resource. We take pride in the fact we can add to local value chains and improve our region’s sustainability. Forestry is a major land use in Leitrim and wood fuel is an important element of a healthy and sustainable forest cycle.”

Kenny McCauley

All of the fuel supplied by McCauley Wood Fuels is certified under the Wood Fuel Quality Assurance (WFQA) Scheme which ensures standardisation, quality and sustainability. The certification requires ongoing in house product testing—primarily focusing on biomass moisture content and particle sizing—which is monitored by independent auditing. The scheme also monitors material sourcing, chains of custody and stock management. The resulting WFQA certified wood fuel provides customers with confidence that all of the products meet the appropriate standards for quality, sustainability and traceability, in compliance with the EU Timber Regulation.

Much of the woody biomass McCauley Wood Fuels processes is supplied from farm forests managed by the Western Forestry Co-op which was established

by dairy co-operatives in western counties in 1985 to provide support services for farmers interested in forestry. As a result, the majority of the material processed by McCauley Wood Fuels is sourced from private forest growers and farmers in the North-West. McCauley Wood Fuels has worked to build a supply chain linked to local forestry and local services. Using the local forest resource is one of the main drivers for the business. The wood to be processed is harvested and transported by local contractors and delivered to a diverse customer base in the region, ranging from small domestic users with solid fuel stoves and wood boilers to larger commercial and industrial users as well as hotels and leisure centres which have a high heat demand.

“ Processing wood fuel uses parts of the trees not suitable for other products and gives forest owners a market for traditionally lower value products at thinning stages. This increases the viability of forest management providing a stronger market for thinning stage products and improves the quality of the yield at the final wood harvest. This is important, not only for the financial return to the forest owner, but also for producing more higher-grade material suitable for applications such as construction, which offer greatest carbon sequestration potential and opportunity to displace carbon intensive materials.”

Kenny McCauley

Using locally grown fuel, processing and supplying it locally keeps the money spent on heating within the region, in contrast to fossil fuels where most of spend leaves the region and provides little local benefit. McCauley Wood Fuels currently displaces up to 150,000 litres of fossil fuel oil per week and intend to continue to grow this over the coming years.

For more information visit

<https://www.facebook.com/McCauleyWoodFuels>

3.3

Key Points and Recommendations

Key Points	Opportunities and Recommendations
Energy Efficiency and Retrofit	
<p>Low levels of energy efficiency and a reliance on home heating fuels with the greatest emissions (oil, coal and peat) mean there is a particular need to specifically address energy efficiency and home heating issues in the Western Region and other rural regions.</p> <p>93% of all the homes in the Western Region homes were built before 2011, so almost 290,000 homes are likely to require some form of energy efficiency upgrades and fuel switching to complete a move to a low carbon economy.</p> <p>More than a quarter of homes in Leitrim (26%) were built before 1960 while only 17% of those in Donegal were. The oldest homes will often face the most significant challenges.</p>	<ol style="list-style-type: none"> 1. Many rural people lack the financial resources to switch to low carbon or carbon free alternatives. Issues for rural dwellers, including those who own their homes, need to be addressed as part of the Just Transition. 2. Given the size of the task and the reliance on the most emitting fuels for home heating the Western Region should be included along with the Midlands in the remit of the Just Transition Commissioner.
<p>Recent falls in oils prices mean that savings from retrofit may be less and payback periods longer than predicted, particularly for homes heated with oil. It may have created a need for greater incentives to switch.</p> <p>Upgraded homes may not be achieve the savings estimated as people become used to higher rooms temperatures.</p>	<p>The Programme for Government commits to using resources from the National Recovery Fund to immediately finance Local Authority retrofit programmes and to offer grants to owners of private properties.</p> <ol style="list-style-type: none"> 3. This effort will initially be focused on the Midlands, where dependence on fossil fuel is greatest. Given the reliance on oil as well as coal and peat in the Western Region it should be included in the first stage along with the Midlands.
<p>With only 5% of Western Region homes achieving a BER rating of B2 or greater, almost 267,000 homes in the Region need to be retrofitted.</p> <p>The heating systems in buildings heated using the most carbon intensive fuels (oil, coal and peat) need to be changed. Almost 80% of homes in the Western Region use oil, coal or peat for central heating compared to 44% in the rest of the state.</p>	<p>Energy efficiency is important and the ambition in the Climate Action Plan and Programme for Government to upgrade at least 500,000 homes to a BER rating of at least B2 is very welcome.</p> <ol style="list-style-type: none"> 4. Given the reliance on oil as well as coal and peat, homes in the Western Region need to be prioritised for retrofit and a programme developed to address the particular issues for rural homes identified in this report.
<p>While deep retrofit is ideal it is also important to promote those energy efficiency measures which improve the insulation and warmth of the home and move from BER of F or G, even if they do not include all measures and remain at C or D rather than fully upgrading to A or B standards.</p>	<ol style="list-style-type: none"> 5. A complete home retrofit and the installation of a heat pump is ideal, but it is important that shallow retrofits are also supported to improve energy efficiency in a step by step manner, particularly given the cost and disruption involved in a deep retrofit. 6. In the shorter term it would be useful to consider introducing a biofuels obligation scheme for heating fuels, requiring the addition of biofuels to kerosene for use in home heating.

Key Points	Opportunities and Recommendations
Home Heating Systems	
<p>Heat pumps are most likely to be most suitable for homes heated using oil. Almost 60% of homes in the Western Region use oil for central heating compared to 36% in the rest of the state.</p> <p>The SEAI found that a similar percentage of homes in the Western Region (11.7%) as in the rest of the State (12.8%) are ready for heat pump installation.</p> <p>Using a less stringent measure 23.2% of Western Region homes are heat pump ready.</p>	<p>The focus of the Climate Action Plan and the Programme for Government is on heat pump installation with a plan to install 600,000 heat pumps by 2030.</p> <p>7. Given the reliance on oil for heating, homes in the Western Region need to be prioritised in the switch to low carbon heating.</p>
<p>Where homes are hard to retrofit (because of their age, building fabric or cost reasons) wood fuel is an important heating option. As it produces high temperature heat it is particularly suited to those older homes where deep retrofit is not a viable option.</p> <p>Rural homes tend to have more space for storage and easier access to wood fuels and other renewable energy.</p> <p>The renewable heat market has the potential to create considerable levels of employment across the Western Region and to provide long-term stable markets for low value wood fuels which can compete with fossil fuels and stabilise energy prices for end users.</p>	<p>8. Wood fuel should be used correctly in appropriately designed boilers and stoves. The wood used should have a low moisture content (less than 20%) so it must have been correctly seasoned or dried. This will both improve the energy efficiency of the fuel and will also significantly reduce the level of particulate emissions.</p> <p>9. Wood fuel should be from forest by-products, creating a value for thinnings and for brash or parts of the trees which do not have other commercial value. The wood fuel should be sourced from a quality assured supplier.</p> <p>10. A statutory upper limit of 20% should be placed on the moisture content of firewood offered for sale. A lesser limit of 25% could be introduced initially.</p>
District Heating	
<p>There is potential for developing district heating systems which use renewable fuels in towns in the Western Region. Population density and scale of heat demand are important for viable district heating projects which require capital intensive investment in the network.</p> <p>Under the Programme for Government there is a commitment to publishing a feasibility study on establishing a district heating authority and setting new targets for district heating as part of a new strategy.</p>	<p>11. Rural towns should be considered in the government feasibility study and a pilot scheme for district heating and funding options developed to make it an attractive option in smaller towns with a sufficient heat load.</p> <p>12. The WDC has previously studied the potential for district heat in a number of towns in the Region and these could make suitable pilot projects.</p>

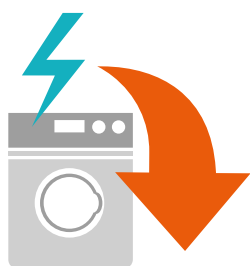
4

Electricity Use and Generation in the Western Region



Electricity is the third energy mode associated with rural living. In 2018 33.2% of electricity came from renewable sources⁶² and there is a Climate Action Plan and Programme for Government target for 70% of electricity from renewable sources by 2030. Renewable electricity is essential to the low carbon future and will increase in importance with greater electrification of heat and transport. Unlike the other areas of energy use, there are few significant differences between urban and rural dwellers in the way electricity is used. However, while patterns of electricity consumption may not differ significantly, there are differences in relation to the impacts of generation, distribution and transmission as well as opportunities for rural dwellers especially associated with generation.

Developing the network to connect renewable energy sources to meet the 2030 target of 70% renewable electricity will mean more opportunity for local generation, at all scales, and more grid development in rural areas. The use of rural energy sources is important to Ireland's move to a low carbon economy, but the financial, employment and enterprise benefits of using local rather than imported energy must be felt throughout rural areas. This will help to increase local acceptance of infrastructure which in turn is essential to meeting climate action targets and enabling significant electrification of heat and transport. The Programme for Government commits to the rapid decarbonisation of the energy sector (p35) and to using this as an opportunity to create jobs across the country.



The energy efficiency of our household appliances has been improving and this in turn should contribute to reducing energy consumption in our homes.

4.1

Using electricity in our homes

In 2018 the residential sector accounted for 30.1% of final electricity consumption, similar to that in 2005 (30.8%). In 2005, however, only 7.2% of all electricity consumed came from renewable sources, while in 2018 33.2%⁶³ did. It is targeted to be 70% by 2030.

Electricity accounted for 25% of Irish household final energy usage 2016 (compared to 37% from oil and 21% from gas). As discussed above, most household energy is used in heating, and oil and gas are the dominant fuels for this though electricity for heating is more important in flats and apartments (as we saw in Galway city, in the previous chapter). Electricity consumption is estimated to average 4,200 kWh per year for households. As rural homes tend to be larger and detached consumption is more likely to be somewhat higher than average.

Lighting and appliances which account for 17% of energy use in the home are mostly powered by electricity. Almost all households have a washing machine, a television and a vacuum cleaner (Fig 9). Dishwashers and tumble dryers are less common, but nonetheless almost two thirds of households have them.

The energy efficiency of our household appliances has been improving and this in turn should contribute to reducing energy consumption in our homes. Lighting, in particular, has seen very significant increases in efficiency with the move away from incandescent bulbs, while new tumble dryers with heat pumps are much more efficient (though also more expensive to purchase). If, however, the number of appliances we use continues to increase, for example more televisions, more tumble dryers or more dishwashers, overall household consumption from appliances could increase⁶⁴.

There is little data on differences in rural and urban electricity consumption but in 2013 (the most recent data) 31 % of customers (634,306) were classified as 'rural domestic' (paying the higher rural standing charge) but rural domestic customers accounted for 34% of domestic demand (2,908 GWh).

62 <https://www.seai.ie/data-and-insights/seai-statistics/key-publications/energy-in-ireland/>

63 SEAI Energy Statistics 2019 report

64 See SEAI's Energy in the Residential Sector for discussion <https://www.seai.ie/publications/Energy-in-the-Residential-Sector-2018-Final.pdf>

Figure 9: Percentage of households with select household appliances 2015-2016



Source: CSO Household Budget Survey 2015-2016

As seen before, rural homes in the Western Region and elsewhere tend to be larger and are more likely to be detached. Larger homes use more energy of all forms will have more lighting and more space for, and demand from, other appliances, although they are less likely than urban homes (apartments in particular) to use electricity as their primary heating source. It will, however, increasingly be used for ground source or air source heat pumps. With most rural homes not connected to the natural gas grid, electricity is more likely to be used for cooking, although bottled gas is also an important cooking fuel in rural areas. Rural homes may also have other specific uses of electricity such as for water pumps from private wells and for certain domestic wastewater treatment systems.

Changes are expected in residential electricity consumption in the future with the move to greater electrification of heating and for vehicle charging. The electrification of heating with a greater use of heat pumps will also increase electricity consumption, though of course it should mean lower overall household energy consumption.

A significant move to Electric Vehicles (EVs) will increase domestic demand. Most EV charging is likely to take place at home, probably overnight (or when electricity is cheaper). Rural homes with off street parking are particularly well suited to this and the lack of other transport options is likely to mean, in the longer term, a

higher number of EVs per rural household than urban, as is the case with cars at present (see Transport chapter). Similarly, the longer distances to be travelled will mean higher electricity consumption by rural vehicles. The WDC is working with more than 100 hubs along the Atlantic Economic Corridor, there are opportunities for such enterprise hubs to provide vehicle charging services, which could also be offered at some Broadband Connection Points, and public wifi access points. It would be useful to pilot charging services for people working in the Hubs, and pilot the provision of real time information and access to hot desking services for people needing to charge their vehicle during a journey so that they can work or reconnect while they wait. The WDC is examining these options.

EVs can act as an important lever for managing electricity demand and are particularly useful where microgeneration has been installed or to maximise demand in periods of renewable generation. It is therefore important to have some link between supports for microgeneration investment (see below), and EV charging mechanisms. There should be 'Demonstration homes' in each county where people can see how low carbon systems (e.g. heat pumps, microgeneration, EV charging and battery storage) operate and integrate and have the opportunity to learn from that householder's experience.

Alongside these changes will be developments in smart appliances and smarter charging allowing for the use of many electricity appliances to be determined by the cost of electricity at a particular time, either because of lower demand on the system, such as at night, for cheaper or low carbon generation (e.g. windy days). While increasing the electrification of heating and transport will increase the use of electricity, automating use decisions will increase the proportion of renewable electricity consumed in the home.

The phased rollout of 250,000 new smart meters has begun. It is expected that from 2021 electricity supply companies will begin to offer new smart products and services and households will be able to shift some consumption to times of the day when electricity is cheaper. Users should also be able to gain a better understanding of how and when they are consuming electricity and to manage it, reducing consumption and taking advantage of cheaper pricing times. The Programme for Government commits to ensuring that the energy efficiency potential of smart meters starts to be deployed in 2021 and that all mechanical electricity meters are replaced by 2024.

In reality though, people have different capacities to engage with detailed management of their electricity consumption. While some of the consumption management will in future be integrated into the appliances being used, it is important that pricing and electricity management structures do not significantly disadvantage those consumers using older equipment, with less money to invest in more expensive electricity appliances, or who are less able to engage with and respond to the information provided by smart meters.

There will be changes in the way we will generate, store, transmit, distribute and use electricity in the coming decades. Many of these will impact on rural life, bringing both opportunities and challenges for rural dwellers. There will be an increase in renewable generation and a phase out of fossil fuel generation. This will take place alongside more efficient use and transmission of electricity. There is likely to be some move from fewer, large scale generators to a more dispersed system with smaller scale generation and microgeneration by homes and businesses. Generation will often be closer to the site of consumption, sometimes at small scale, including domestic level, and storage options will become more important.

4.2

Changes in electricity generation and supply—some impacts for rural dwellers

The Climate Action Plan target for 70% of electricity to be generated from renewable sources by 2030 means that up to 10,000 megawatts of additional renewable generation will need to be connected to the electricity system⁶⁵. The Programme for Government commits to producing a whole-of-government plan setting out how it will deliver at least 70% renewable electricity by 2030 and how it will develop the necessary skills base, supply chains, legislation, and infrastructure to enable it. This new plan will make recommendations for how the deployment of renewable electricity can be speeded up.

Rural areas are the site of most electricity generation and with the move to 70% renewable electricity, the location of generation will often be in areas with most wind or potential for solar generation. This means that many rural dwellers in the Western Region are, and more will be, living in proximity to wind and solar farms and the infrastructure needed to transmit and distribute electricity from them. This has, on occasion, given rise to concerns for rural dwellers and delays in electricity infrastructure development. The Programme for Government commits to finalising the Wind Energy Guidelines, having regard to the public consultation that has just taken place.

EirGrid's stated goal is to achieve the required increase in renewables while minimising the addition of new infrastructure, but there will have to be an increase in the large-scale infrastructure of pylons, substations and overhead wires. The way that these are rolled out across Ireland and the engagement with those living in areas affected by it will be important. While the need to resolve the climate crisis provides an urgent rationale for investment, and the shift to renewable energy has important benefits for our society, locally, nationally and globally, it is important that the benefits of the investment and infrastructure are shared with rural areas and that there is a true participative approach to consulting, planning and building the required network.

⁶⁵ <http://www.eirgridgroup.com/about/strategy-2025/EirGrid-Group-Strategy-2025-DOWNLOAD.pdf>

It is also to be hoped that improved ways of consulting, planning and building such as that outlined in EirGrid's new strategy to 2025, the draft wind energy guidelines, and the Renewable Electricity Support Scheme (RESS) will allow people living in rural areas to contribute to the planning and development of renewable electricity generation in their areas and to benefit from the investments in their locality.

Community Energy in the Programme for Government

The Programme for Government commits to bringing communities along as new energy infrastructure gets installed and to:

- Increase the target for the number of Sustainable Energy Communities.
- Prioritise the development of microgeneration, letting people sell excess power back to the grid by June 2021.
- Ensure that community energy can play a role in reaching at least 70% renewable electricity, including a community benefit fund and a community category within the auction.
- Continue to work with the EU to agree community participation as an integral part of installing new renewable energy and a route for community participation in the projects.
- Support a new Green Flag programme for communities, building on the successful programme in schools.
- Conclude the review of the current planning exemptions relating to solar panels, to ensure that households, schools, and communities can be strong champions of climate action.

These policy changes, along with further development of the Sustainable Energy Communities (SECs) also provide opportunities for those rural dwellers who can afford it to become involved at the individual home scale, at community level, and potentially shareholders, in the commercial generation projects.

At a community level, there are also options for rural areas to become involved in the Sustainable Energy Community (SEC)⁶⁶ network. There are currently over 380 communities in the network with a target of

increasing this to 1,500 in the Climate Action Plan. As well as householders the SEC can include a range of different energy users such as homeowners, sports clubs, community centres, local businesses and churches. Each community develops an energy use masterplan covering all aspects of energy use and resources. The focus is not just on electricity but on increasing the efficiency and sustainability of all energy use and will form a key part of the rural transition. Where communities develop their own energy projects and generate revenue they can act as social enterprises, investing their profits in projects which benefit their community.



Where communities develop their own energy projects and generate revenue they can act as social enterprises, investing their profits in projects which benefit their community.

⁶⁶ <https://www.seai.ie/community-energy/sustainable-energy-communities/community-network/>

What is a Sustainable Energy Community?

In a Sustainable Energy Community (SEC) everyone works together to develop a sustainable energy system for the benefit of the community.

This is achieved by:

- Aiming, as far as possible, to be energy efficient (Use less)
- Using renewable energy where feasible (Use clean)
- Adopting smart energy solutions (Innovate)

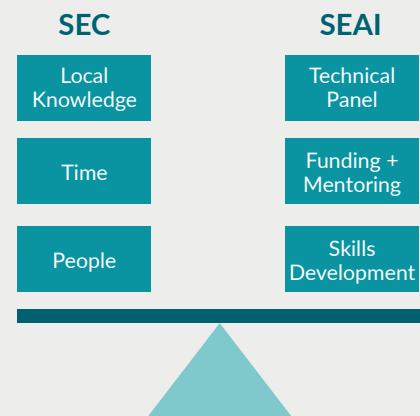
The SEC partnership approach aims to enable bottom-up community energy solutions. SEAI partners with willing communities in planning for their energy future. There are already more than 370 communities in the SEAI's SEC network representing a diverse network of skills and interests including small rural towns and large urban centres, residents' associations, Tidy Towns committees, local environmental groups, business groups and housing associations.

The benefits for communities joining the SEC Network include:

- Thinking about energy use in the community in an informed way
- Mentoring and Learning supports
- Learning from communities who have conducted local energy projects
- Learning from energy experts
- A variety of grants are available for energy efficiency and renewable energy installations

The Communities develop an Energy Master Plan with a baseline of current energy use, a quantification of energy spend (€), use (kWh), efficiency (BER) and emissions (CO₂) and an assessment of resources. The community develops a list of potential projects in different categories with targets, ranking them in order of priority.

Read more here: <https://www.seai.ie/community-energy/sustainable-energy-communities/>



The WDC was a partner in the Interreg Northern Periphery and Arctic Programme Local Energy Communities (LECo) project which provides transnational learnings on models and funding mechanisms for community energy projects⁶⁷.

In order to increase local participation in electricity generation the new Renewable Electricity Support Scheme⁶⁸ (RESS) will have a specific strand for projects with a majority community ownership and whose primary purpose is community benefit (environmental, economic or social) rather than financial profit. In addition to this option, every project developer must contribute to a Community Benefit Fund at a rate of €2 per MWh every

year (which could be more than €200,000 annually for a community from a 40 MW wind farm). Potentially, in future, a community investment scheme may allow people to invest in their local project.

These policy options will help to ensure more local involvement in generation projects (either community projects or as shareholders in projects developed by others) through these mechanisms and will provide opportunities for rural people to share the benefits of the move to greater electrification and renewable generation in rural Ireland.

67 The models and learnings are available here <https://localenergycommunities.net/>

68 <https://www.dccae.gov.ie/en-ie/energy/topics/Renewable-Energy/electricity/renewable-electricity-supports/ress/Pages/default.aspx>

CASE STUDY

Claremorris and Western District Energy Co-Operative

Claremorris and Western District Energy Co-Operative was founded in 2015 to develop community owned renewable energy, to bring energy benefits and support to communities and to address climate change in the West of Ireland.

The co-operative is a community enterprise engaged in the development and commercialization of renewable energy technologies. The focus is on developing financially viable renewable energy projects particularly in district heating, solar, biogas, and micro grid applications. They also aim to educate people on community ownership and renewable energy and their associated benefits and impacts. With over 50 members, the energy co-operative is helping communities to make the transition to the low carbon economy. With the support of the local groups and the co-operation of local businesses, the co-op has gained valuable experience in the development of a local energy deployment, while contributing to national policy.

“ We are an established community energy co-operative with real project experience and our electricity generation and other projects will bring real benefits to the town of Claremorris. We aim to be a centre of excellence and a model for community renewable energy in the West of Ireland and beyond.”

*J.P. Prendergast, Chairman,
Claremorris & Western District Energy Co-Op*

They recently founded Community Power, with four other organisations, to supply community electricity to people across Ireland. To do this they are developing two solar parks (with photovoltaic (PV) panel arrays) to generate more than 10MW of electricity. Community Power is Ireland's first community owned electricity supplier. It is a partnership of community energy groups working for a sustainable energy future for Ireland and grew out of Ireland's first community owned wind farm, Templederry Wind Farm in Co Tipperary.

They have planning permission for a 5MW, 20 acre solar park located on the old Claremorris landfill site and also have permission for another 5.4MW solar park near the town. It was chosen for its southerly aspect, relatively flat contours, and the potential to provide a nearby connection to the national grid. Once these become fully operational the electricity will be exported to the national grid and supplied customers through Community Power.

The project has submitted an application to the Renewable Electricity Support Scheme (RESS) and will be bidding in the first auction in August 2020. They are one of the first community projects to do this. As both parks have planning permission and grid connection offers it is expected they will be able to begin supply in 2022. Electricity generation will give the Energy Co-Op the revenue to invest in other renewable energy and energy efficiency projects including district heating schemes for the town. It is envisaged that Claremorris will reduce carbon emissions by 25% by 2020

For more information go to
<http://www.claremorris-energy-coop.com/>



At a small scale there are significant opportunities for individual rural dwellers to become involved in microgeneration. Installing solar panels for electricity generation or solar thermal systems for water heating are likely to be the best options but small scale hydro and wind may be installed where the conditions are good. The microgeneration of electricity can be for 'self-consumption' purposes, with the electricity generated first going to power home appliances, electric heating systems (such as heat pumps) and to charge EVs. Electricity generated can also be stored for use later in batteries, including those in EVs or stored in other energy forms such as hot water and in heating systems.

The Climate Action Plan, commits to the launch of a pricing support regime by June 2021 for micro-generation which will mean householders will be paid for the electricity they produce and do not use themselves. Thus many rural dwellers, particularly those who live in detached, unshaded houses, and who have capital to invest, are in a good position to become involved in small scale electricity generation.

Microgeneration

Microgeneration involves the installation of small electricity generators, such as, by households or small businesses, which produce electricity and can reduce the amount that would otherwise be used from the grid. This can help to increase overall levels of renewable electricity and participation in the energy transition by engaged, active consumers. Microgeneration can include technologies such as solar photovoltaic (PV), or wind turbines, small hydroelectric schemes, and micro combined heat and power (CHP).

ESB Networks has a process in place to facilitate the connection of microgeneration that produce less than 6kW (11kW for 3 phase connections) and the smart meters being installed (the meter replacement programme is to be completed by 2024) will be able to provide customers with accurate information throughout the day about their electricity use and export arising from microgeneration. This will facilitate the implementation of systems for payment for the output of microgeneration.

The Climate Action Plan states that a support scheme for microgeneration will be put in place by the Government by 2021 at the latest. This support scheme will be designed and implemented by the Department of Communications, Climate Action and Environment.

For more information about Microgeneration and policy developments expected read the Commission for Energy Regulation's Microgeneration Information Paper here: <https://www.cru.ie/wp-content/uploads/2020/05/CRU20059-Microgeneration-Information-Paper.pdf>

The benefit of supporting microgeneration goes beyond the monetary value of the sale of exported electricity particularly in terms of the importance of consumers playing their part in the energy transition. While potentially only making a small contribution to meeting Ireland's overall renewable energy targets in quantity terms, microgeneration can play an important role in increasing public understanding and acceptance of low-carbon technologies, and associated infrastructure, and facilitate a shift in system demand.



The microgeneration of electricity can be for 'self-consumption' purposes, with the electricity generated first going to power home appliances, electric heating systems (such as heat pumps) and to charge EVs.

CASE STUDY

Comharchumann Fuinnimh Oileáin Árann The Aran Islands Energy Co-op

Comharchumann Fuinnimh Oileáin Árann is a community owned energy co-operative on the Aran Islands. Through the Co-op, the three islands are working towards becoming self-sufficient in locally generated renewable energy and free of dependence on oil, coal and gas by 2022.

“ Our vision is to make the islands ‘lighthouse’ communities to show the way in the energy transition and in the process to become centres of excellence in the whole area of renewable energy and sustainable living. This will give our islands a positive role within the national community, create a broader range of employment on the islands, and maintain our islands’ valuable heritage.”

Dara Ó Maoilthia, Comharchumann Fuinnimh Oileáin Árann Teoranta (Chairperson)

The Co-op was set up in 2012 as a non-profit organisation whose members are residents and businesses located on the Aran Islands. They are now nearly 8 years into their 10 year project to make the Aran Islands fossil fuel free.

There are three legs to the project: **heating, transport and electrification**:

- On the **heating** front, they are slowly upgrading all 500 homes and other buildings on the islands. A few hundred homes have already been retrofitted, some to a very high level, and more are planned. Retrofits include external wall insulation on the older homes, with heat pumps for hot water and heating, and solar PV on the roofs.
- On the **transport** front, the Renault Fluence EVs are visible on Árainn, as are the Renault Kangoo EVs, both vans and people carriers. Residents also have the Nissan Leaf and the BMW EV. These electric cars are ideal for the islands. For active travel the islands have over 1,000 bicycles (including electric ones) and 30 ponies and traps available for hire.
- For **electrification**, there are almost 50 houses (10%) fitted with air to water heat pumps, and with 2 kW of photovoltaic panels installed on their roofs. There are also 10 homes with geothermal heating. They have nearly 100 houses with solar hot water panels. Battery storage has also been introduced on a few buildings.

They are also involved in Community Power and a number of European research projects, SEAFUEL and HUGE researching hydrogen production as a fuel for islands, RESPOND is testing Demand/Response technologies in people’s homes and GEOFIT is developing new group technology for geothermal heating. An Irish partnership called SECURE funded partly by SEAI, is developing a pilot micro grid on Árainn. These partnerships bring the benefits of networking, education and training, experience, and funding into the community. Through them they employ 3 people. Being part of the Clean Energy for EU Islands Secretariat has put them in touch with other European island communities.

The Co-op is also hoping to install a 2.3MW wind turbine for Árainn (Inis Mór) which will be big enough to supply all the islands’ needs. Its location will be away from tourist routes, houses and from the most scenic areas. It will supply clean electricity to the homes and businesses on Aran, and create sustainable employment. This size turbine could be expected to bring about €300,000 into the local community each year after the initial payback period of 5- 10 years. How the profits are spent would be decided by the island shareholders.

The money could be used to:

- Reinvest in further renewable energy installations;
- Subsidise the retrofitting of homes or the purchase of electric vehicles;
- Invest in local infrastructure for the benefit of all islanders.

Using this bottom-up approach allows the energy citizens in the local community to take power into their own hands. There is wind, wave and solar energy available locally, and by harnessing it for their community needs they are creating a citizen’s revolution where power comes from and stays on the islands. In the process, they are creating sustainable communities, cleaning up the planet and mitigating climate change.

Read more about the Co-op here:
<http://www.aranislansenergycoop.ie/>

4.3

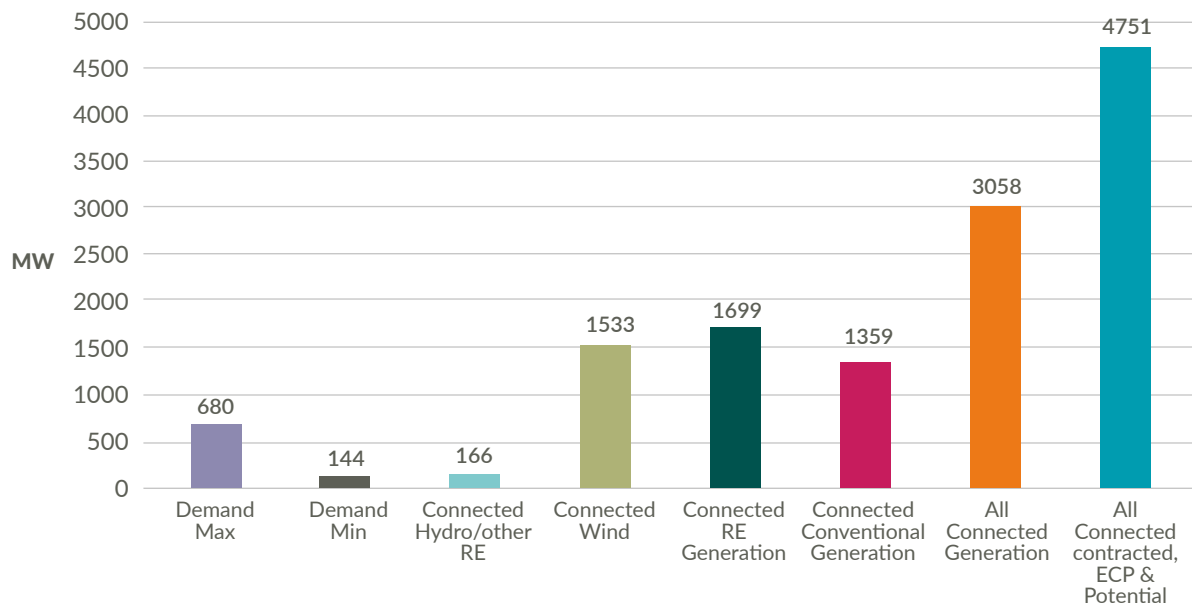
Electricity Generation in the Western Region

The Western Region already has significant connected renewable generation; more than half (55%) of the generation in the Region is renewable (Figure 10). There is also 1,359 MW of conventional generation capacity. This capacity is mainly in the Moneypoint coal fired power station in Co. Clare (855MW) although this has been offline or operating below capacity in recent years⁷⁰. Tynagh gas fired power station in Co. Galway (400MW) and Tawnaghmore oil fired peaking plant in Co. Mayo (104 MW) are the other sites of conventional generation in the Region.

In the future with the ending of coal fired generation at Moneypoint, as committed to in Climate Action Plan⁷¹, the majority of electricity generation in the Western Region will be renewable (Fig 10), coming from onshore wind and other developing sources including solar and, in the long term, potentially offshore wind and marine generation.

Renewable generation currently connected (1,699 MW) produces approximately 4,690 GWh of electricity. Considering peak demand of 680MW, the total demand in region is approximately 3,870 GWh⁷². On an annual basis the Western Region is currently producing enough renewable generation to meet 120% of its own demand⁷³.

Figure 10: Current Generation and Demand in the Western Region (MW)



Source: www.esb.ie, www.eirgrid.com and MullanGrid Consulting

There is 165MW of hydro generation in the WDC region. This capacity is mainly at Ardnacrusha hydro station in Co. Clare (86MW) and the Erne stations (65MW) in Co. Donegal. On shore wind generation makes up the rest of the renewable electricity generation in the Region (the locations are discussed further below).

The Western Region is thus a net provider of renewable electricity to the rest of Ireland making a significant contribution to the 2020 RES-E targets.

⁷⁰ The Climate Action Plan includes a commitment to end the burning of coal in Moneypoint by 2025, and replace coal-fired generation with “low-carbon and renewable technologies”.

⁷¹ Moneypoint is due to close in 2025, and it is likely that it will be operating well below capacity in the coming years

⁷² Assuming a nationwide demand capacity factor of 65%

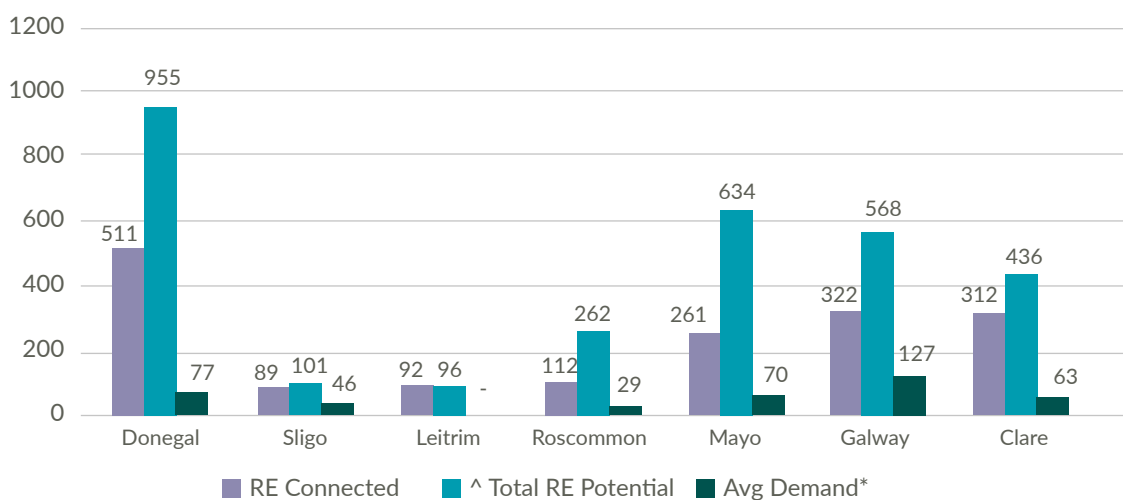
⁷³ See <https://wdcinsights.wordpress.com/2018/12/20/electricity-generation-and-demand-in-the-western-region-a-renewable-story/> for more discussion, Most recent figures updated by Mullan Grid.

The potential for renewable generation and the opportunities the Region provides are significant; the total connected, contracted and potential (ECP) generation capacity is 3,052MW. By the end of 2025, much of this could be in place and with Moneypoint to close in 2025 renewable generation could then account for 86% of total capacity (which would be 3,556MW from all generation sources) in the Western Region.

electricity transmission network to provide additional capacity. There is capacity in the current transmission system for more renewable generation in areas of the Western Region including large parts of Co. Roscommon, Co. Clare and Co. Galway.

However, there is concern about the pace and scale of development of new transmission circuits elsewhere in the Region. The areas of particular concern in the medium term are Co. Donegal and North Mayo.

Figure 11: Generation and Demand in Western Region counties



Source: www.esb.ie, www.eirgrid.com and MullanGrid Consulting.

^ Total RE potential generation capacity includes connected, contracted, ECP-1 and ECP-2; *This is a simple average of Min and Max demand. Leitrim demand is included with Sligo

In the Western Region (Figure 11), Donegal, which has the third largest connected capacity of on shore wind generation in Ireland, is clearly significant force in the Region’s transition to renewable electricity. Galway and Clare and the next most important counties for renewable generation, these counties have high levels of contracted wind generation which could be connected in the short to medium term. In all Western Region counties currently connected renewable generation is well above the average county demand.

The transmission system has been essential in enabling the Western Region to achieve relatively high levels of renewable generation. There has been substantial investment in the transmission network in the Region much of which has been spent upgrading the existing

The WDC will establish an energy infrastructure stakeholder group which will include electricity generation developers and users and state agencies as well as those impacted by infrastructure to consider how best to support electricity infrastructure investment in the region where it is necessary.

120%

On an annual basis the Western Region is currently producing enough renewable generation to meet 120% of its own demand.

4.4

Key Points and Recommendations

Key Points	Opportunities and Recommendations
Making the Transition- Electricity	
<p>The 2030 target of 70% electricity generation from renewable sources will be a very significant driver of change and is necessary to facilitate Ireland's move to a low carbon society.</p> <p>Rural dwellers have a role to play in this by making a contribution to electricity supply, through microgeneration and involvement in community renewable electricity generation projects.</p> <p>Managing the just transition fairly and on a balanced regional basis will be a challenge but it is important that the issues for rural dwellers are addressed by the Just Transition model.</p>	<p>There is significant future potential for electrification of heat and transport in rural areas, but many rural dwellers lack the financial resources to switch to or invest in low carbon or carbon free alternatives.</p> <ol style="list-style-type: none"> 1. A variety of finance models are needed to support different home and household types in making the investment in the low carbon transition. Different households have different financial capacity and needs, loans may work for some, easy-payback mechanisms (e.g. through utility bills) might be better for others. 2. There should be alignment between the mechanisms in the National Retrofitting Plan in the Programme for Government which focuses on the built environment and with investment in electric vehicle charging and household electricity management systems.
Making the Transition - Electricity Use	
<p>The energy efficiency of our household appliances has been improving which in turn should contribute to reducing energy consumption in our homes. If, however, the number of appliances we use continues to increase, overall household consumption from appliances could grow.</p> <p>The phased rollout of 250,000 new smart meters has begun. It is expected that from 2021 electricity supply companies will begin to offer new smart products and services. Households will be able to shift some consumption to times of the day when electricity is cheaper or has lower carbon intensity.</p>	<p>People have different capacities to engage with detailed management of their electricity consumption.</p> <ol style="list-style-type: none"> 3. Some of the consumption management will, in future, be integrated into the appliances being used. Nonetheless it is important that pricing and electricity management structures do not significantly disadvantage those consumers using older equipment, with less money to invest in more expensive electricity appliances, or who are less able to engage with and respond to the information provided by smart meters.
<p>A significant move to Electric Vehicles (EVs) will increase domestic demand. Most EV charging is likely to take place at home, probably overnight or when electricity is cheaper.</p> <p>Rural homes with off street parking are particularly well suited to this. The lack of other transport options is likely to mean, in the longer term, a higher number of EVs per rural household than urban, as is the case with cars at present.</p> <p>As well as being used to power the car, EV batteries can serve as energy stores, charging when electricity is cheap or low carbon and being used to supply the household at times when electricity is expensive or renewable energy is less available.</p>	<p>EVs can act as an important lever for managing electricity demand and are particularly useful where microgeneration has been installed or to maximise demand in periods of renewable generation.</p> <ol style="list-style-type: none"> 4. It is important to have some link between supports for microgeneration investment, and EV charging mechanisms. 5. There should be 'Demonstration homes' in each county where people can see how low carbon systems operate and have the opportunity to learn from that householder's experience.

Key Points	Opportunities and Recommendations
Electricity Use contd.	
<p>The longer distances to be travelled in rural areas will mean higher electricity consumption by rural vehicles and greater need for charging at destinations such as workplaces or for working while a vehicle is charging during a journey.</p>	<p>The WDC is working with more than 100 hubs along the Atlantic Economic Corridor. There are opportunities for enterprise hubs to provide vehicle charging services, which could also be offered at some Broadband Connection Points, and public wifi access points.</p> <p>6. We will work to pilot charging services for people working in the Hubs, and pilot the provision of real time information and access to hot desking services for people needing to charge their vehicle during a journey so that they can work or reconnect while they wait.</p>
Microgeneration	
<p>There are significant opportunities for individual rural dwellers to become involved in microgeneration which can be used immediately or stored.</p>	<p>The Climate Action Plan and the Programme for Government commit to the launch of a pricing support regime for micro-generation which will mean householders will be able to sell excess power back to the grid by June 2021.</p> <p>7. It is important this deadline is met and the mechanisms to be put in place should be clearly signposted so that householders and suppliers are investment ready.</p>
Community Energy	
<p>The Renewable Electricity Support Scheme (RESS) will allow rural and other communities in rural to participate in the development of renewable electricity generation in their areas and to benefit from the investments in their locality.</p> <p>To do this they should become involved in the SEAls Sustainable Energy Community (SEC) network which provides step by step support. Each community develops an energy use masterplan covering all aspects of energy use and resources.</p> <p>The Interreg Northern Periphery and Arctic Programme Local Energy Communities (LECo) project, in which the WDC was a partner, provides transnational learnings on models and funding mechanisms for community energy projects.</p>	<p>There is scope for communities to develop electricity generation projects which will create revenue for that community. These community energy projects are acting as social enterprises which can invest the revenue in other initiatives, energy related or otherwise, to the benefit of their community.</p> <p>8. The WDC Western Investment Fund will continue to support communities in the transition to a low carbon future by providing loans to communities, and bridging loans to allow them to continue to work while awaiting grant payments.</p> <p>9. When communities can take ownership of projects and generate their own revenue they can invest it in areas that are important to them. Energy Co-ops such as Claremorris and Western District and Comharchumann Fuinnimh Oileáin Árann Teoranta could act as demonstration communities for others in the Western Region.</p>

Key Points	Opportunities and Recommendations
Electricity Infrastructure	
<p>With the move to 70% renewable electricity, the location of much generation will be in rural areas with most wind or potential for solar generation.</p> <p>This means that many rural dwellers in the Western Region are, and more will be, living in proximity to wind and solar farms and the infrastructure needed to transmit and distribute electricity from them. This has, on occasion, given rise to concerns for rural dwellers and delays in electricity infrastructure development.</p>	<p>10. The WDC will work with work with energy agencies and the SEAI SEC mentors, as well as with DCCAE and the CRU, to ensure that to ensure needs of rural dwellers and their communities are reflected in policy.</p> <p>While the need to resolve the climate crisis provides an urgent rationale for the shift to renewable energy, it is important that the benefits of the investment and infrastructure are shared with the rural areas where the infrastructure is located.</p> <p>11. There must be a true participative approach to consulting, planning and building the required network.</p> <p>12. Rural areas need to benefit economically from this investment too, not just in terms of community benefit funds but also as a means of increasing employment in rural communities.</p>
<p>The Western Region already has significant connected renewable generation; more than half (55%) of the generation in the Region is renewable</p> <p>The Western Region is currently producing enough renewable generation to meet 120% of its own demand. In all Western Region counties currently connected renewable generation is well above the average county demand.</p> <p>The Region is a net provider of renewable electricity to the rest of Ireland making a significant contribution to the 2020 RES-E targets, and to the target of 70% renewable electricity generation by 2030.</p>	<p>There is capacity in the current transmission system for more renewable generation in areas of the Western Region including large parts of Co. Roscommon, Co. Clare and Co. Galway.</p> <p>13. There is concern about the slow pace and scale of development of new transmission circuits elsewhere in the Region. The areas of particular concern for future generation connection in the medium term are Co. Donegal and North Mayo. There needs to be a clear plan for future investment in these areas.</p> <p>14. The WDC will establish an energy infrastructure stakeholder group which will include electricity generation developers and users and state agencies as well as those impacted by infrastructure to consider how best to support electricity infrastructure investment in the region where it is necessary.</p>

5

Conclusion



The climate challenge is complex. It affects all aspects of our lives, and many changes are needed in the ways we live and work, some small and incremental and others very big. As we have shown in this report there are few simple solutions and, most importantly, there is no single solution in any area. It is important that we consider all ways of addressing the climate challenge and all ways of reducing our energy use and emissions. Different options will work effectively in different situations and bring different enterprise and employment opportunities. Technological change and changes in society could provide opportunities and solutions that we are not currently considering so we must be open to any changes that can make a difference.

We have examined the challenges for our Western Region homes in terms of efficiency and heating. They are significant but newer homes are more efficient and our older homes can be made so. There are low carbon choices for the way we heat our homes. The challenges in transport are also significant, but using the opportunities for remote work, for more active travel and for increased public transport in rural areas, alongside a move to more EVs, will make a difference. We will use more electricity, and there will be a need for more electricity generation and infrastructure, but there are opportunities for people and communities to participate in this and benefit from the change.

There are competing trends in energy use. New homes are much more efficient than old ones but at the same time average home size is rising. Our appliances and lights are more efficient and the electricity to power them is increasingly renewable, but we have many more devices in use. Our cars and other vehicles are more fuel efficient but we travel more. During the next decades we must significantly reduce our energy demand and at the same time move to more renewable sources of energy.

There is no significant body of work, internationally or nationally, on climate change and emissions issues for rural dwellers in developed countries yet there are important differences in energy use patterns and emissions. While it is often acknowledged that rural dwellers have higher individual emissions the ways of addressing these have not previously been explored in Ireland, partly because emissions reductions may be more difficult to achieve in rural areas and partly because the focus is usually on larger populations and reducing the emissions of people living in more densely populated areas.

The focus of much government policy is on electrification which our communities can participate in and which will bring local and individual benefits but there are also significant bioenergy opportunities in our Region in terms of heating fuel supplies as well as the potential for biogas for heat and transport. These, along with the energy efficiency retrofit programmes and the generation of more renewable electricity can provide opportunities for more employment in the rural Western Region.

Rural dwellers will be significantly affected by the low carbon transition. It will impact on every aspect of our lives, some of the changes are expensive and the significant increases in carbon taxes will cost rural dwellers more than others. A variety of finance models are needed to support different home and household types in making the investment in the low carbon transition. Different households have different financial capacity and needs, loans may work for some, easy-payback mechanisms (e.g. through utility bills) might be better for others and grants must also be available. The government is committed to a just transition. This must mean the higher costs and greater complexities of the transition for rural dwellers are addressed.

Pursuing a low carbon vision for the Region will not only contribute to achieving Ireland's climate change commitments but can also deliver wider benefits. These include improved energy security, economic opportunities from renewable and indigenous fuels and significant benefits in the areas of health, lifestyle, travel costs, local environment and air quality. Rural dwellers need to make the most of these benefits too. The focus of this report has been on the rural Western Region but our findings are applicable to much of rural Ireland and actions can be replicated elsewhere and implementation of changes can be integrated.

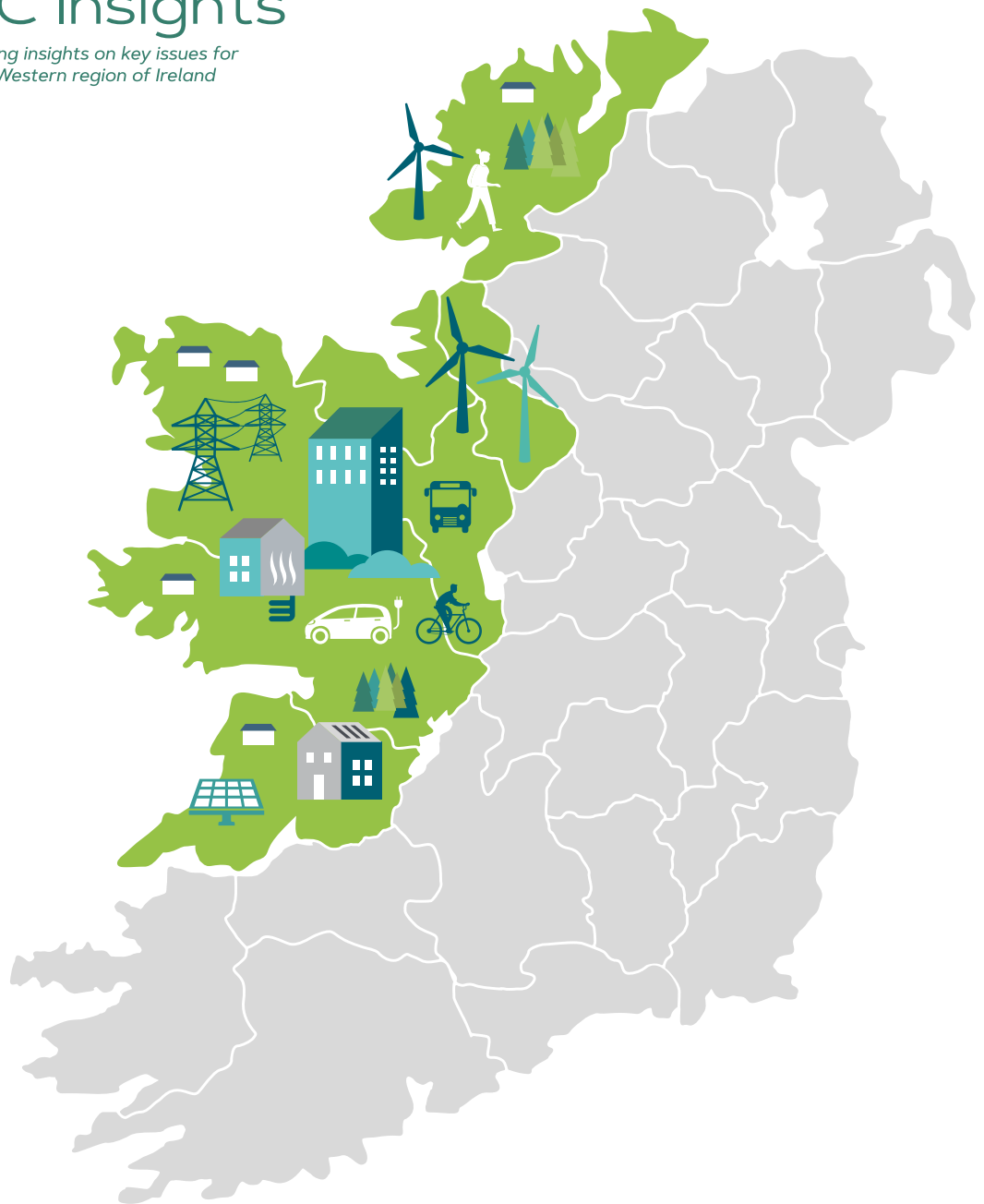
This report, which focuses on the current situation and where we need to be in a low carbon future, is just a start. The WDC will continue to work on the move to a low carbon Western Region. We will work with the Just Transition Commissioner to ensure that the needs of our region in relation to retrofit and changing heating systems are prioritised. As we have shown in this report, we have challenges in relation to home energy efficiency, we are very reliant on fossil fuels for heating, and as a rural region face significant transport challenges in the transition. The WDC will continue to work with agencies across region to make our Region a model for low carbon rural areas. Our regional remit means we are uniquely placed to coordinate and share experiences across counties and among local and regional organisations.

There are opportunities for us to invest in enterprises which are solving some of the issues facing the Region and beyond. We are currently developing a sustainable enterprise strategy. Taking the long-term view, we will identify, support and develop key sectors to build a sustainable low carbon future. We will analyse the needs of those emerging sectors that will build a sustainable competitive advantage for the region in the long term.

We will promote practical, effective change in the way we live, work and do business in the region so that our communities, our society and our regional economy are ready to meet challenges and prepared to take the opportunities the low carbon transition will bring.

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