

# Powering today and tomorrow.



Vision Document



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# Foreword

Almost 30 years ago, petrol station operators, home heating suppliers and other essential businesses came together to form the Irish Petroleum Industry Association (IPIA). The organisation became a strong advocate for its members on issues around fuel specifications, revenue and safety and as the years passed, our focus on environmental concerns increased.

Now, as our global climate emergency rightly dominates almost all policy discussions, including those taking place within our industry, the focus of our association also has shifted. We all must play our part in achieving carbon neutrality in Ireland by 2050 and for our members, this means fundamentally transforming the way we do business and the liquid fuels we provide.

**Fossil fuels cannot be the basis of Ireland's long-term energy plans, or the basis of our industry's long-term business strategy.**

One thing is abundantly clear – our current level of dependence on fossil fuels is entirely unsustainable. But, with Ireland still heavily dependent on oil, turning off the tap on supply is simply not a realistic option. Without liquid fuels, almost 700,000 homes would be without heat, our supermarket shelves would be empty, our critical infrastructure and emergency services would be substantially degraded, our farms would be rendered completely unmanageable, flights would be permanently grounded, international trade would be frozen and our family connections and social and professional lives would be enormously disrupted.

We are engaged in a transition from huge dependence on fossil fuels to becoming carbon neutral by 2050. While we are absolutely determined to continue to power Irish motoring, heating, agriculture, industry and travel to 2050 and beyond, we need to do so while gradually decreasing our dependence on oil. Some of the alternatives such as FAME and ethanol have already been widely introduced and we are only beginning to explore the potential of others – like hydrogen and green compressed natural gas. We will explore every avenue, and take every necessary step, to reduce greenhouse gas emissions from the products we bring to the Irish market.

We have already demonstrated our adaptability and willingness to embrace new products and practices. The total number of EV charging points in place across the networks has increased by almost 50% in the last five years alone, and 330,000 tonnes of carbon emissions are being prevented through current biofuel blending in road transport fuels. However, in order to help Ireland hit its target of net carbon-zero by 2050, we will need to go much further.

**The fuels on which we depend today will not be those that power Ireland's tomorrow.**

In the next few decades, our reliance on petrol, diesel and kerosene will reduce and may ultimately be eliminated entirely, but our society must continue to function. We will still need liquid fuels to drive our cars, to enable hauliers to deliver goods, to heat our homes, to allow businesspeople and holidaymakers fly overseas and to allow shipping companies to bring cargo to and from our island.

Our fuels will change, and as such, our association must also change. We are no longer an Irish Petroleum Industry Association. Instead, we are a group of those who provide Fuels for Ireland. We are determined to make Ireland's energy transition a reality, and one that works for all of society. Working together, Fuels for Ireland will play a key role in building an environmentally sustainable future.

**Kevin McPartlan**  
**CEO, Fuels for Ireland**



# Introduction

Fuels for Ireland - formerly known as the Irish Petroleum Industry Association - brings together companies involved in the importation, distribution and marketing of petroleum products, low carbon liquid fuels and other means to power transport, heating, agriculture, aviation and industry in Ireland.

Our membership is made up of Applegreen, Circle K, Corrib Oil, East Cork Oil, Emo, Inver Energy, Irving Oil, LCC, Maxol, Top Oil and Valero.

Fuels for Ireland promotes the interests and represents the views of the industry - particularly when it comes to environmental, regulatory, revenue and health and safety issues.

For decades, our members have performed an essential role in Irish society, and they continue to carry out this work each day by providing the State and its citizens with the reliable supply of energy necessary to power Ireland's transport and heating sectors.

**There is no doubt that oil-based products play an absolutely vital role in powering Ireland,<sup>1,2</sup>**

and this is likely to continue for many years to come, with the International Energy Agency predicting that Ireland's oil demand will continue growing up to 2035.<sup>3</sup>

The technological advantages of liquid fuels - the unmatched energy density, the ease with which they can be handled and distributed and their low cost compared to alternatives - have meant that these fuels have played a crucial role in private road transport and public transport, and in both the maritime and aviation sectors. In addition, oil products are used to heat almost 700,000 Irish homes.

For the foreseeable future, a very substantial proportion of Ireland's energy requirements will come from oil.

**But times change. And liquid fuels are changing too.**

Fast-moving technological developments are transforming the liquid fuels which are used in transport, home heating, aviation and maritime.

As part of our quest to power Ireland sustainably into the future, Fuels for Ireland works alongside industry leaders including FuelsEurope: the organisation which promotes economically and environmentally sustainable refining, supply and use of petroleum products and advanced lower carbon liquid fuels across the EU.

In 2018, FuelsEurope published its groundbreaking 'Vision 2050' document, which outlined the industry's plans to use low-carbon liquid fuels to progressively replace conventional fuels in order to dramatically reduce CO2 emissions while still providing Europe's people with the low-carbon fuels which they need.

The same solutions exist here in Ireland, where Fuels for Ireland members are already implementing wide-ranging measures to change Ireland's relationship with petroleum products and dramatically reduce emissions in our sector.

<sup>1</sup> SEAI, *Ireland's Energy Projections*, [https://www.seai.ie/publications/Irelands\\_Energy\\_Projections.pdf](https://www.seai.ie/publications/Irelands_Energy_Projections.pdf)

<sup>2</sup> Department of Communications, Climate Action and Environment, *Oil Key Facts*, <https://www.dccae.gov.ie/en-ie/energy/topics/Oil/oil-key-facts/Pages/Oil-Key-Facts.aspx>

<sup>3</sup> IEA, *Ireland 2019 Review*, P39

# Current Reality.

**Oil production and use can be expected to decline gradually in the coming decades, but we cannot abandon petroleum-based products immediately.**

Our industry is indispensable when it comes to the task of fuelling Ireland's present and future.

Oil remains the dominant source of energy in Ireland, accounting for almost half of the country's Total Primary Energy Requirement.<sup>4</sup> The reliance is even greater in a number of key sectors, particularly in the area of transport, where according to the SEAI, 97% of transport energy came from oil-based products in 2018.<sup>5</sup>

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<sup>4</sup> SEAI, *Energy in Ireland 2018 Report*, <https://www.seai.ie/publications/Energy-in-Ireland-2018.pdf>

<sup>5</sup> SEAI, *Renewable Energy in Ireland 2020 Update*, <https://www.seai.ie/publications/2020-Renewable-Energy-in-Ireland-Report.pdf>

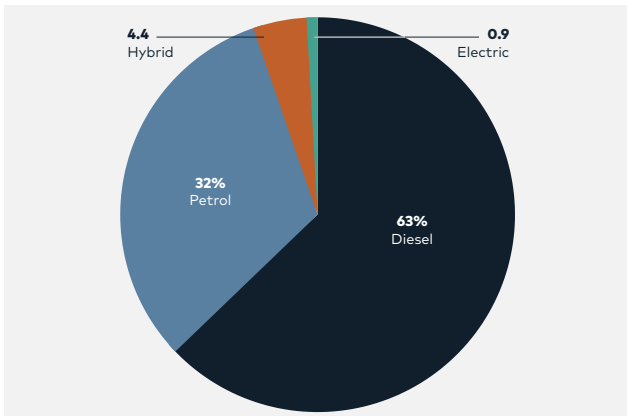




# Small Vehicles

Even though the number of hybrid vehicles and electric vehicles is gradually increasing, the CSO's statistics on the 157,127 vehicles licensed for the first time in 2018 showed that consumer demand for liquid fuelled vehicles remains very strong.

**63% of newly-licensed vehicles were diesel-fuelled.**



### What are the Statistics?

In all, 63% of the newly-licensed vehicles were diesel-fuelled, with 32% being fuelled with petrol, 4.4% being hybrids and just 0.9% of the vehicles being electric.<sup>6</sup>

Given that vehicles end up being used for many years – the latest figures showed that the average age of the private vehicle fleet is over eight years<sup>7</sup> – it is clear that recently-licensed vehicles will be with us for a long time to come. It is also clear that the overwhelming majority of cars on Irish roads will require liquid fuels to function for the foreseeable future.

**Over 1.2 million people commute to work every day via car.**



### Why are Liquid Fuels so Important?

The importance of an effective means of fuelling road transport cannot be overstated.

Road transport is vital to Ireland's economy, and cannot take place without liquid fuels. According to the most recent CSO figures, over 1.2 million people commute to work via car, while almost 200,000 others use buses or trains, the great majority of which of course also require the use of diesel and other fuels.<sup>8</sup>

<sup>6</sup> Central Statistics Office, *Measuring Ireland's Progress 2018 - Ireland: Vehicles licensed for the first time*, <https://www.cso.ie/en/releasesandpublications/ep/p-mip/measuringirelandsprogress2018/environment/#d.en.215516>

<sup>7</sup> Cartell.ie, *Age of Private Fleet Drops on Younger Import*, <https://www.cartell.ie/2019/02/age-private-fleet-drops-younger-import/>

<sup>8</sup> Central Statistics Office, *Press Statement Census 2016 Results Profile 6 - Commuting in Ireland*, <https://www.cso.ie/en/csolatestnews/pressreleases/2017pressreleases/pressstatementcensus2016resultsprofile6-commutinginireland/>



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## Liquid fuels allow us to stay in touch with loved ones.



### Staying in Touch with the Ones we Love

Not only do liquid fuels power Ireland's transport system and enable our prosperity, they also power Ireland's society and allow for the interconnectedness which binds people together.

Thanks to car, bus and rail transport, we can travel to see our families and friends and stay in touch with the ones we love.

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## Car use is particularly important in rural areas in Ireland.



### Ireland's Rural Population

Car use is particularly important in Ireland, given that we have a disproportionately rural population spread out across the countryside to the point where public transport will probably never be an option when it comes to meeting the transportation needs of many Irish people.

# Shipping & Air Transport

It is not just cars, vans, trucks, buses and trains which are powered using liquid fuels. As an island economy fundamentally dependent on international trade, Ireland is heavily reliant on shipping and air transportation: modes of transport which are powered by liquid fuels and where alternative sources of energy are even harder to find.

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**Without the shipping sector, ferry travel would not be possible.**



### Why the Shipping Sector Matters

Without the shipping sector, passengers could not travel to or from Ireland on ferries. Many of the products in our homes and on shop shelves could not be brought here. Irish exporters would have no way of reaching the customers they sell to internationally.

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**In 2018, 36.5 million passengers passed through Irish airports.**



### The Importance of Shipping and Aviation Fuels

In 2018, 36.5 million passengers passed through the main Irish airports.<sup>9</sup> These journeys are also only made possible by the existence of aviation fuel.

Without aviation and shipping fuels, Ireland would be cut off from the world around us, just as without road and rail transport, we would be cut off from our family, friends, colleagues and customers.

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<sup>9</sup> CSO, *Aviation Statistics*, <https://www.cso.ie/en/releasesandpublications/er/as/aviationstatisticsquarter4andyear2018/>



# Powering Transport via Electricity.

In many areas, work is underway to achieve progress in battery technology to allow for the powering of transport via electricity.



Substantial progress has already been made in some areas such as passenger cars, but even in that case, the size of existing batteries can prove to be a limitation when travelling long distances or at high speeds. The problem becomes even more challenging when it comes to the task of powering heavy-duty vehicles, planes and ships.

Right now, it is estimated that battery technology would need to achieve a ten-fold reduction in weight in order to become a viable substitute for liquid fuels beyond passenger cars and light commercial transport, and a technological breakthrough of this type is hard to foresee between now and 2050.<sup>10</sup>

The electrification of transport will play an important role in meeting our goals when it comes to reducing emissions and improving air quality, but an exclusive focus on it does not help us to address the real challenges which remain, and nor does it take away from the major improvements in technology in other areas.

Thanks to remarkable improvements in engineering and design, it has already been demonstrated that modern Euro 6 cars are as effective as EVs when it comes to helping cities become compliant with air quality standards.<sup>11</sup>

Currently, EVs tend to be heavier than comparable vehicles due to the large batteries which they contain, and this has an impact in increasing the amounts of particulate matter they cause to be released. Given that particulate emissions from modern passenger cars are mainly due to mechanical abrasion (brake, road and tyre wear), which means that newer diesel cars produce roughly the same level of emissions as EVs.<sup>12</sup>

EVs will undoubtedly play an important role in the decarbonisation of the transport sector but electrification is not a panacea, but thankfully it is not the only solution available to us.

<sup>10</sup> FuelsEurope, *Vision 2050: A Pathway for the Evolution of the Refining Industry and Liquid Fuels*

<sup>11</sup> Concawe, *Report: A comparison of real driving emissions from Euro 6 diesel passenger cars with zero emission vehicles and their impact on urban air quality compliance*, [https://www.concawe.eu/wp-content/uploads/2018/04/Rpt\\_18\\_8.pdf](https://www.concawe.eu/wp-content/uploads/2018/04/Rpt_18_8.pdf)

<sup>12</sup> Concawe, *Report: A comparison of real driving emissions from Euro 6 diesel passenger cars with zero emission vehicles and their impact on urban air quality compliance*, [https://www.concawe.eu/wp-content/uploads/2018/04/Rpt\\_18\\_8.pdf](https://www.concawe.eu/wp-content/uploads/2018/04/Rpt_18_8.pdf)

While batteries can power small vehicles effectively, as vehicle size increases, the size of the battery required increases dramatically. This creates practical challenges across many areas.



Figure 1. Limited Electrification Beyond the Bus and Light Truck Segment

# Irish Homes & Hospitals

Liquid fuels are absolutely crucial when it comes to fulfilling the task of heating Irish homes. Almost 700,000 homes in this country are heated using oil-fired heating systems.<sup>13</sup>

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**Almost 700,000 Irish homes are heated by oil-fired systems.**



## **A Well-Proven Technology in Ireland**

While oil heating is common across Europe, with around 17% of households using it,<sup>14</sup> this well-proven technology is especially popular in Ireland due to a range of advantages for Irish householders. 40% of Irish homes (and more than 75% of those in some counties) rely on oil for heating.

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**Our hospitals rely on liquid fuel powered emergency generators.**



## **Who Else Needs Liquid Fuels?**

There are a multitude of other areas where liquid fuels are absolutely indispensable in Ireland, from agriculture to industry and much more between.

Many hospitals, for example, rely on liquid fuel powered emergency generators should they be disconnected from their regular source of electricity, as do many other public buildings.

<sup>13</sup>. CSO, *Types of Heating in Permanent Housing Units by Province County or City, Nature of Occupancy, Type of Private Accommodation, Statistical Indicator and Census Year*, <https://statbank.cso.ie/px/pxeirestat/Statire/SelectVarVal/saveselections.asp>

<sup>14</sup>. ECFD/Eurofuel/FuelsEurope/UPEi, *Heating with Liquid Fuels*





# Financial Contribution

In addition to the social and economic contribution which the members of Fuels for Ireland make, the financial contribution of the oil industry is also highly significant.

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**Total tax take from oil products was over €3.2 billion in 2019.**



## **How Much Revenue is Generated from the Tax on Oil Products?**

Tax accounts for most of the pump price for diesel and petrol, and the total tax take from liquid fuel products was just over €3.2 billion in 2019 - more than 5% of Ireland's total tax revenue,<sup>15</sup> and enough to cover the costs of both the National Children's Hospital and the planned motorway between Cork and Limerick.

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**Fuels for Ireland is playing a massive role in Irish life.**



## **The Role of Fuels for Ireland Members**

In making modern life possible, in powering Ireland's transportation system and in heating Ireland's homes, the members of Fuels for Ireland are playing a massive role in Irish life.

While we recognise that how we work will change substantially in the years to come, we are committed to continuing to perform these vital tasks up until 2050 and much further beyond.

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<sup>15</sup> IPIA, *Sector Profile*, February 2019

## **What does deep retrofitting involve?**

According to the SEAI, a deep retrofit of a home involves carrying out multiple energy upgrades all at once to achieve a BER of A-rating. This involves a range of potential steps including: wall insulation, roof insulation, floor insulation, window upgrades, the installation of a heat pump and mechanical ventilation. Solar water heating panels or solar photovoltaic panels may also be installed.<sup>17</sup>



**Just Transition. We need to change how we operate in order to meet our goals of becoming carbon neutral by 2050. Ireland's future, and the future of the planet as a whole, depends on us taking bold and decisive action.**

That means changing the fuels we use and changing how we use them by building on recent technological innovations in road transport and other areas.



**The challenge facing Fuels for Ireland is clear: reducing CO2 emissions while providing the Irish economy and the Irish people with the low-carbon fuels which we need to drive our country forward to 2050 and beyond.**

The energy transition which is taking place will bring considerable opportunities, but it will also bring challenges for us, as well as for our customers and partners throughout Ireland. We need to make different choices, and we need to help the rest of society to make different - and better - choices as well.

Business-as-usual is not an option.

**Fossil fuels cannot be the basis of Ireland's long-term energy plans, or the basis of our industry's long-term business strategy.**

Fuels for Ireland's members fully recognise that we need to change how we do business, but we also have to ensure that our climate goals are not achieved at a giant cost to the most vulnerable, including lower-income earners, older people and those living in rural Ireland.

Since the introduction of carbon tax in 2010, consumers of petroleum products have faced ever higher prices, and this process is likely to continue in the coming years.

**However, there should be no penalties where there are no alternatives.**

Fuel taxes rarely if ever reduce demand, given the fact that a huge number of people need to use liquid fuels as part of their daily lives. As a result, tax hikes in this area can appear to be a form of stealth taxation which targets those who currently have no realistic alternative forms of transportation or home-heating.

While public transport options can improve, many people will feel they still need their own private transport.

But that does not mean that an energy transition cannot be achieved.

An increasing number of energy alternatives - including biofuels and next generation fuels - are being developed and coming on stream, and these have the capability to provide the low carbon fuels we need in our cars, vans, trucks and buses.

Similarly, it is clear that large-scale reductions in home heating emissions need to be achieved in order to make our sector carbon neutral.

The installation of efficient, modern condensing oil boilers can reduce home heating emissions by 20% and deliver matching cost savings, and boiler upgrades can be carried out cheaply and quickly.



The use of heat pumps is often held up as the only possible solution when it comes to reducing emissions from home heating.

Although heat pumps can make an important contribution in helping to lower emissions from new houses, heat pumps are usually installed as part of a **"deep retrofit"** process, and the cost of carrying out this work on older houses – estimated at between €35,000-€60,000<sup>16</sup> - is beyond the reach of many homeowners.

Given the enormous costs involved, a policy that is aimed at carrying out a massive deep-retrofitting programme alone is unlikely to succeed in meeting the State's carbon reduction objectives.

The installation of a low-cost boiler replacement scheme which would reduce their emissions and energy costs, on the other hand, could prove to be highly advantageous.

Consumers need solutions like this, which are cost effective and which work.

In order to achieve the energy transition we need, all stakeholders at national and EU level need to focus on measures which are realistic and effective, not populist or unachievable.

Furthermore, we need an approach which is focused on technological neutrality: which means looking for ways to bring about substantial emissions reductions, whether that be through the use of electricity or any other innovative means of achieving our objectives.

There is no one way of dramatically reducing carbon emissions instantaneously, but our industry is now putting in place a range of measures which can help to achieve our goal of becoming carbon neutral by 2050.

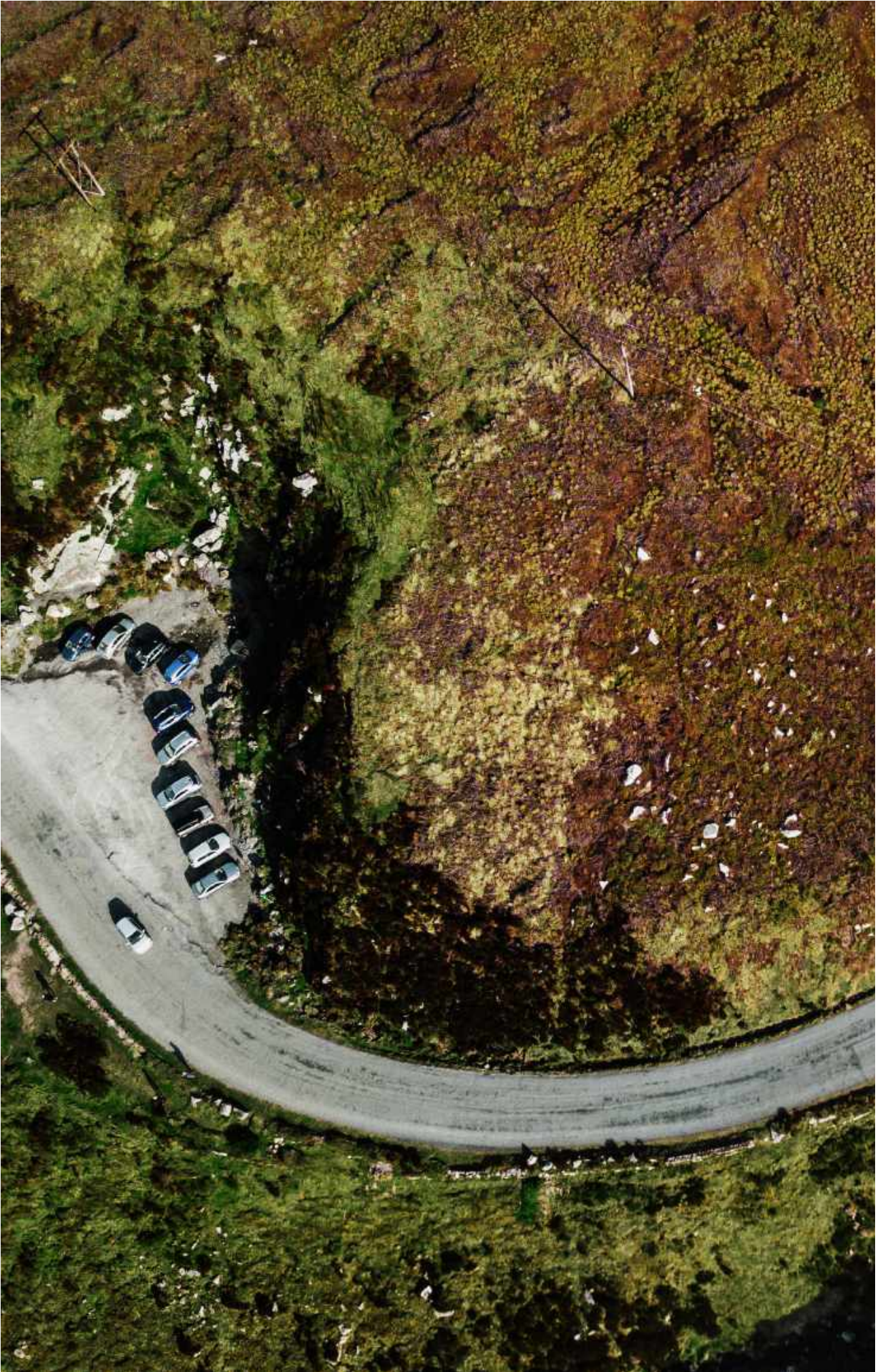
We are engaged in or planning research programmes, trials, research and development and modelling projects to quantify the emission savings which can be achieved through a combination of more efficient boilers and low carbon liquid fuels.

**We will reduce greenhouse gases from the home heating products we supply by 50% by 2035.**

There are solutions, and Fuels for Ireland's members are committed to revolutionising how we do business.

<sup>16</sup>. SuperHomes, <https://superhomes.ie/>

<sup>17</sup>. SEAI, *Deep Retrofit Grant*, <https://www.seai.ie/grants/home-energy-grants/deep-retrofit-grant/>



**Powering Ireland's Road Transport. Fuels for Ireland is determined to continue powering Ireland's road transport, but we know that changing the way we do this will be crucial to reducing the environmental impact of the transport sector.**

By 2050, we want liquid fuel for road transport in Ireland to be net climate neutral, and we have a plan to achieve this.<sup>18</sup>

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<sup>18</sup> FuelsEurope, *Clean Fuels for All: High Level Statement - Next Steps*



The task ahead will be a massive one. With the CSO projecting that the population of the Republic of Ireland could increase to 6.7 million over the next three decades,<sup>19</sup> Ireland will need more transportation options, and better ways of powering the cars, vans, buses and trucks which our people depend on.

Electric vehicles (EVs) and hybrid vehicles (which use both electricity and liquid fuels) constitute one part of the solution.

An Post, for example, has already become the first postal service in the world to attain zero carbon emission delivery status in a capital city by launching its new electric vehicles.<sup>20</sup>

Similarly, Dublin Bus has already taken delivery of its first hybrid double-decker buses, and the National Transport Authority is planning to purchase 600 hybrid buses over the next five years.<sup>21</sup>

The Government has set itself a target of massively increasing the number of EVs and hybrid vehicles over the coming decades as part of the Climate Action Plan, and Fuels for Ireland's members have not been found wanting when it comes to supporting the option of moving to EV or hybrid vehicles.

The growing numbers of EVs and hybrid vehicles and the gradual improvement in this technology is already changing the face of Irish forecourts, as filling station operators install electric charging points.

Over the last five years, the number of EV charging points provided by Fuels for Ireland members on their forecourts has increased by 50%. The 'Forecourt of the Future' is quickly becoming a reality, and it will be a vital part of fuelling Ireland sustainably and efficiently.

However, it is also clear that most consumers are still steering clear of EVs.

The CSO's statistics for the newly licensed vehicles in 2018 showed that almost 95% of them were fuelled by diesel or petrol, with hybrids accounting for just 4.4% of the total figure. Ultimately, over 99% of the vehicles licensed for the first time that year required some liquid fuel.<sup>22</sup>

The people who purchased these cars and other vehicles will be using them for years to come, and cost impediments will make it extremely difficult for a large proportion of the population to immediately switch to EVs.

Many other commuters will also find the limitations on range and size to be challenging, particularly given the respective advantages of conventional cars.

EVs are most efficient and convenient for urban use and short, predictable, low-speed journeys. Many drivers need to be able to drive long distances across the country without having to plan for lengthy stops at service stations along the way.

The ease and convenience with which conventional cars can be fuelled will be a key factor for commuters in the coming years, along with the large-scale infrastructure which is already in place as part of Ireland's widespread network of filling stations.

Additionally, the substantial improvements in combustion engine technology which have taken place in recent decades are continuing, and are likely to deliver significant efficiency and environmental gains in the coming decades.<sup>23, 24</sup>

The engine of the present is already a very different proposition to the engine of the past, which will encourage many drivers to stick with liquid-fuelled vehicles which are equipped to fully meet their needs.

<sup>19</sup> The Irish Times, *Population could grow to 6.7m by 2051, says CSO*, <https://www.irishtimes.com/news/ireland/irish-news/population-could-grow-to-6-7m-by-2051-says-cso-1.3537977>

<sup>20</sup> RTE.ie, *An Post - First zero emissions postal service provider in the world*, <https://www.rte.ie/news/business/2020/0207/1113891-an-post-first-zero-emissions-postal-service-provider/>

<sup>21</sup> The Irish Times, *NTA to purchase 600 hybrid buses over five years*, <https://www.irishtimes.com/news/environment/nta-to-purchase-600-hybrid-buses-over-five-years-1.3954903>

<sup>22</sup> CSO, *Ireland: Vehicles licensed for the first time by type*, <https://www.cso.ie/en/releasesandpublications/ep/p-mip/measuringirelandsprogress2018/environment/#d.en.215516>

<sup>23</sup> The Independent, *5 ways modern car engines differ from older engines*, <https://www.independent.co.uk/5-ways-modern-car-engines-differ-older-engines/>

<sup>24</sup> Wired, *As electric cars surge, the gas engine keeps getting better*, <https://www.wired.com/story/internal-combustion-engine-technology-argonne/>

Analysis from the research organisation Concawe has shown that the significantly reduced nitrous oxide emissions from modern Euro 6d diesel passenger cars will be as effective as zero emission vehicles in helping cities become compliant with air quality standards.<sup>25</sup>

Furthermore, Irish road transport and the fuels which our members provide are gradually being transformed thanks to the introduction of a range of new and next generation liquid fuels.

We believe that these low-carbon liquid fuels can play a crucial role in the transition which needs to occur between now and 2050.

The advantages of liquid fuels for road transportation are well-known. Liquid fuels such as diesel and petrol have a high energy density, are easy to transport and store, and can provide the fuel to power vehicles of all sizes: from the smallest car to the heavy goods vehicles which are crucial to our economy.

The transformation of the liquid fuels which our industry provides to Irish commuters is already taking place.

As part of the Biofuels Obligation Scheme, oil suppliers are required to ensure that more than 11% of the motor fuel they place on the market is produced from renewable sources such as bioethanol and biodiesel.<sup>26</sup>

The percentage of fuel which must be from renewable sources has gradually been increased, and

**Fuels for Ireland believes that the Irish Government should mandate the use of E10 fuel from 2021 onwards,**

in order to increase the amount of biofuels which are being used to power Irish road transport.

New types of fuels with radically lower emissions are also becoming available.

Fuel cell and hydrogen technologies hold great promise in both transport and energy applications, and are already part of the Strategic Energy Technologies (SET) Plan which has been adopted by the EU.<sup>27</sup>

Hydrogen brings with it multiple advantages, and is likely to play a key role in delivering the emissions reductions we need to see between now and 2050. Hydrogen-fuelled vehicles are emissions-free, boast

a longer driving range and the fuel which powers them is easy to use and easy to store.<sup>28</sup>

Plans are already in place to roll out a hydrogen fuelling infrastructure across Ireland over the next decade.<sup>29</sup>

Liquefied natural gas (LNG) and compressed natural gas (CNG) also present exciting opportunities in the area of transport fuels.

Other technological solutions are also on the horizon, including the use of liquid E-fuels made from renewable power. Though they are at an earlier stage of the evolutionary process, E-fuels offer a number of advantages including significant CO2 reductions, a higher energy density compared to electricity, the ease with which they can be transported and stored, and the degree to which they could be integrated within the existing transportation infrastructure.<sup>30</sup>

These new fuels are complementary to electrification, and together with the use of EVs they will help us to achieve our goal of making road transport climate neutral by 2050.

That is why it is essential that the Government's targets for reducing emissions in cars should be focused on encouraging zero emissions vehicles, rather than specifying that one policy tool - electrification - must always be used.

Recent analysis by Concawe has shown that a scenario where lower carbon liquid fuels were to become a core part of Europe's energy transition (with a 68% fuel share by energy) would deliver substantial carbon reductions similar to the level which would be achieved in a High EV scenario (where the electrification rate of passenger cars and light-duty vans reached a 90% share).<sup>31</sup>

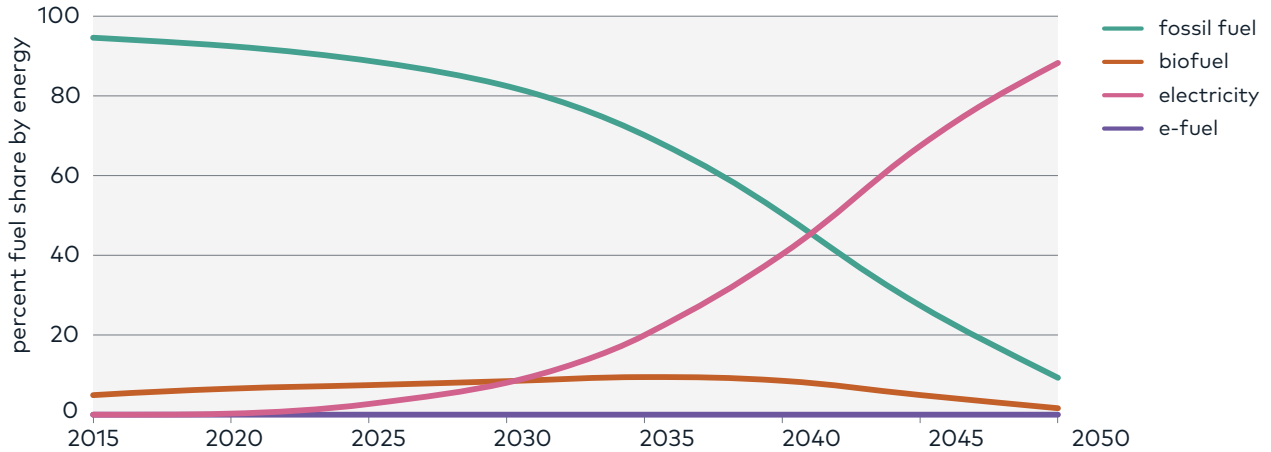
The advantages of this diversified technological approach are manifold. By dramatically improving the fuels which we use, we can give consumers a choice between low carbon technologies, thereby ensuring that climate neutrality is accessible to all Irish people, regardless of where they live or what their transport needs are. By doing this, we will be able to aid in the just transition which we are seeking to achieve.<sup>32</sup>

By promoting the use of low carbon liquid fuels, we can also reduce the deployment cost of electric energy distribution while taking advantage of the tried and tested energy distribution system which the members of Fuels for Ireland operate in every part of this country.<sup>33</sup>

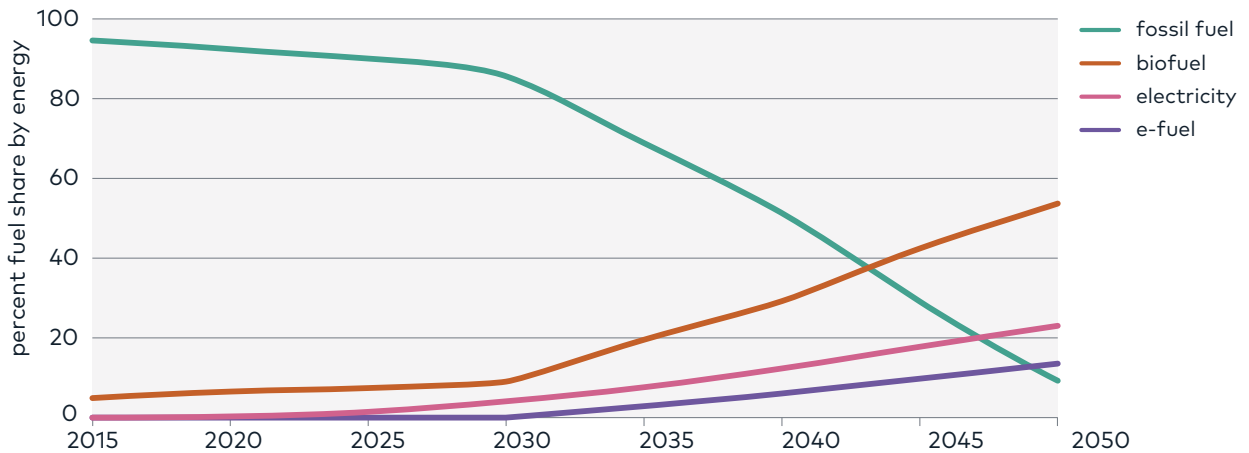
Importantly, the ground-breaking developments which are taking place in the use of low-carbon liquid fuels for road transport will also help to lay the

groundwork for developing new and effective liquid fuels for the marine and aviation sectors, which will become even more important in the coming decades.

**Fuel share for the High EV scenario**



**Low Carbon Fuels scenario – fuel share by energy**



<sup>25</sup> Concawe, *Report: A comparison of real driving emissions from Euro 6 diesel passenger cars with zero emission vehicles and their impact on urban air quality compliance*, [https://www.concawe.eu/wp-content/uploads/2018/04/Rpt\\_18\\_8.pdf](https://www.concawe.eu/wp-content/uploads/2018/04/Rpt_18_8.pdf)

<sup>26</sup> NORA, *Biofuels Obligation Scheme*, <https://www.nora.ie/biofuels-obligation-scheme.141.html>

<sup>27</sup> FCH, *Fuel cells and hydrogen*, <https://www.fch.europa.eu/page/who-we-are>

<sup>28</sup> H2View, *DHL: 5 reasons why hydrogen is the fuel of the future*, <https://www.h2-view.com/story/dhl-5-reasons-why-hydrogen-is-the-fuel-of-the-future/>

<sup>29</sup> The Irish Times, *Plan for 80 hydrogen fuel stations for Ireland by 2030*, <https://www.irishtimes.com/business/innovation/plan-for-80-hydrogen-fuel-stations-for-ireland-by-2030-1.4026492>

<sup>30</sup> Concawe, *A look into the role of e-fuels in the transport system in Europe (2030-2050) (literature review)*, <https://www.concawe.eu/wp-content/uploads/E-fuels-article.pdf>

<sup>31</sup> Concawe, *Impact analysis of mass EV adoption and low-carbon intensity fuels scenarios*, <https://www.concawe.eu/wp-content/uploads/Low-carbon-fuels-scenarios.pdf>

<sup>32</sup> Cambre, *FuelsEurope 2050 Communications - Communication*

<sup>33</sup> FuelsEurope, *FuelsEurope's contribution to a climate-neutral Europe*

**We need a flexible approach from the Government and all stakeholders: a pragmatic approach which will be focused on delivering measurable results in carbon reductions, while ensuring that affordable and effective home heating is within the reach of all Irish families.**

# Powering Ireland's Homes. Liquid fuels are absolutely crucial when it comes to fulfilling the task of heating Irish homes.

Almost 700,000 Irish households are heated using a liquid fuel, according to the CSO. In all, 40% of homes currently use kerosene.<sup>34</sup> Compared to other European countries, we are particularly dependent on this type of heating, as only 17% of EU households are heated using liquid fuels.<sup>35</sup>

## Percentage of private households in Ireland using oil central heating systems



<sup>34</sup> CSO, *Private households by type of central heating by county 2016*, <https://www.cso.ie/en/releasesandpublications/ep/p-rsdgi/regionalsdgsireland2017/env/>

<sup>35</sup> ECFD; Eurofuel; FuelsEurope; UPEi, *Heating with liquid fuels: pathway for a sustainable future* [https://www.eurofuel.eu/images/Heating\\_with\\_liquid\\_fuels.pdf](https://www.eurofuel.eu/images/Heating_with_liquid_fuels.pdf)

Furthermore, the reliance is much greater in rural areas where connection to the natural gas grid is not an option: for example, a massive 76% of households in Monaghan are heated with liquid fuels.<sup>36</sup>

There are many reasons why so many Irish families choose to rely on home heating oil:<sup>37</sup>

- **Suitability for rural and off-grid areas:** Oil or liquid fuels are often the only realistic option for rural Irish dwellers, or those whose homes cannot be connected to the gas grid.
- **Density and convenience:** As with transport, liquid fuels have the great advantage of having a high "energy density." This means that one refill of heating fuel can heat a household for many months.
- **Security of supply:** Liquid fuels can be stored on the property, and Fuels for Ireland members based around the country can quickly resupply people when necessary. Experienced personnel are also available to maintain and upgrade such heating systems.
- **Efficiency:** Modern condensing boilers are particularly efficient, and such heating systems can be combined with renewable energy such as solar.
- **Choice:** The plethora of oil distributors offers choice to consumers and competition in this market ensures lower prices for users.

Huge numbers of Irish people have long relied on oil heating systems, and almost half of Irish homes still do. Liquid fuels will remain a crucial part of our energy mix long into the future.

Moreover, as technology improves oil boilers are becoming more and more efficient as the industry takes steps to help consumers lower their emissions.

Industry estimates suggest that there are about 400,000 older non-condensing oil boilers in service in this country. These non-condensing boilers are very inefficient compared to the modern condensing boilers, which can deliver significant CO2 emissions reductions while boosting boiler efficiency, thus resulting in major cost savings for households.

In this area, the energy sector has been taking a lead in working to deliver CO2 reductions. In 2014, oil boiler manufacturers, with guidance from the trade organisation OFTEC, agreed to only manufacture and sell condensing oil boilers.<sup>38</sup>

Every year, around 20,000 boiler upgrades are carried out by industry personnel to improve the existing home heating stock by installing modern condensing boilers.

Using the January 2020 Sutherland Tables for a 1980's 3-bed semi in ROI as the basis for analysis, if you were to upgrade a standard efficiency oil-fired boiler (70% HTG & 35% DHW) to a condensing oil-fired boiler (80% HTG & 40% DHW), you would achieve an:

- **18.3%** reduction in overall running costs (€1527 compared to €1869)
- **19%** reduction in CO2 emissions (1,944 L compared to 2,400 L)
- **19%** overall efficiency gain (20,120 kWh heat input compared to 24,840 kWh heat input)

Other types of home heating also exist, including the use of heat pumps. These devices are powered by electricity, and are an increasingly common feature in new homes.

The use of heat pumps requires very high energy efficiency rates, which in many homes necessitates a 'deep retrofit' of the house. This large-scale and time-consuming process involves the completion of multiple energy efficient measures in order to upgrade a home to a B2 Building Energy Rating (BER).

The Government has set highly ambitious targets within the Climate Action Plan to get 400,000 existing homes to install heat pumps by 2030.<sup>39</sup>

Early indicators are that these goals will not be met however, and recent analysis carried out by the Department of Public Expenditure and Reform has also suggested that retrofitting for older homes tends to reduce household carbon emissions by only a fraction of what was initially expected.<sup>40</sup>

<sup>36</sup> CSO, *Private households by type of central heating by county 2016*, <https://www.cso.ie/en/releasesandpublications/ep/p-rsdgi/regionalsdgsireland2017/env/>

<sup>37</sup> ECFD; Eurofuel; FuelsEurope; UPEi, *Heating with liquid fuels: pathway for a sustainable future*, [https://www.eurofuel.eu/images/Heating\\_with\\_liquid\\_fuels.pdf](https://www.eurofuel.eu/images/Heating_with_liquid_fuels.pdf)

<sup>38</sup> Eurofuel, *How oil condensing boilers have helped reduce heating costs and CO2 emissions in UK and Ireland*, <https://www.eurofuel.eu/library/case-studies/item/99-how-oil-condensing-boilers-have-helped-reduce-heating-costs-and-co2-emissions-in-uk-and-ireland>

<sup>39</sup> Climate Action Plan, <https://assets.gov.ie/25419/c97cdecdf8c49ab976e773d4e11e515.pdf>

Even if deep retrofitting and the installation of heat pumps did deliver the desired carbon reductions, the processes are highly expensive.

### The installation of a heat pump as part of a deep retrofitting process can cost between €35,000 and €60,000.<sup>41</sup>

Even with the support of a grant, the prohibitively large expense puts a retrofit well beyond the reach of many lower-income families.

Older homeowners are unlikely to invest this amount of money for an upgrade process which involves a considerable amount of work within their homes, and over a protracted period also.

Calls to increase taxes to encourage switching home heating fuels are unlikely to be effective, but would present homeowners with much higher energy bills.

A core part of a just transition is ensuring that there should be no financial penalty on people where there is no alternative to their current energy usage patterns.

But there are alternatives which can deliver significant emissions gains.

The installation of modern condensing boilers - which can deliver a reduction of 19% in CO<sub>2</sub> emissions and annual cost savings of €342 - is taking place across Ireland on a continuous basis, and costs €1,900 on average. Every week, around 400 boiler upgrades are being carried out.

In addition, the liquid fuels mix which is being used to heat Irish homes will change significantly in the coming decades.

Large-scale pilot projects are already underway internationally which involve the use of waste products in order to produce low carbon liquid fuels which could in the future be used for home heating purposes. For example, a facility in Nevada will convert 175,000 tonnes of household waste into 10.5 million gallons of fuel annually.<sup>42</sup>

Closer to home, we believe that substances such as FAME (Fatty Acid Methyl Ester, which is based on vegetable oil which is processed with methanol to produce a liquid fuel) and HVO (Hydrotreated Vegetable Oil, which is produced from used cooking oil, residues from the food industry and from vegetable oils which are not intended for food)

can eventually form part of the solution to help ensure we can fuel Ireland's homes sustainably to 2050 and beyond.<sup>43</sup>

Also, the interlinked nature of the energy market in Europe - and the fact that the home heating oil which is used in Irish homes is virtually identical to aviation fuel - opens up an exciting range of possibilities at a time when sustainable aviation fuel is being developed which reduces greenhouse gas emissions by up to 80% compared to fossil fuel-based jet fuel.<sup>44</sup>

Leading airlines such as KLM are already being supplied with sustainable fuel to replace kerosene,<sup>45</sup> the product which is commonly used to fuel Irish homes. In the coming years, we can expect to see further developments in this area, and this will have major positive implications for our members who supply liquid heating fuels to Irish consumers.

Fuelling Irish homes while reducing our emissions will be a challenging process, but it can be done successfully. A clear and well-defined pathway to a sustainable future in this area exists.

It involves (a) maximising the boiler efficiency in Ireland by continuing to move towards modern oil-fired condensing boilers, (b) integrating these energy sources with renewable sources such as solar and (c) progressively increasing the use of low-carbon fuels for home heating as they become available.<sup>46</sup>

We need a flexible approach from the Government and all stakeholders: a pragmatic attitude which will be focused on delivering measurable results in carbon reductions, while ensuring that affordable and effective home heating is within the reach of all Irish families.

The ambitious programme for reducing emissions for home energy which the Government has embarked upon - and which we welcome - needs to acknowledge the role that the industry can play, not only in setting targets for the long-term but in delivering results in the short and medium-term too.

## Perspectives for liquid fuels in heating on the way to 2050



### Step 1

Tap into the great potential for energy savings and CO<sub>2</sub> emission reduction through the replacement of existing systems with high-efficiency condensing oil boilers to the widest extent possible

### Step 2

Integrate renewable sources through hybrid heating systems backed up by oil

### Step 3

Produce ever-cleaner liquid fuels and progressively increase the use of low-carbon fuels through research into innovative solutions such as new-generation bioliquids or Power-to-Liquid

<sup>40</sup> The Irish Independent, 'Billions on retrofitting old houses will only cut emissions by a fraction of expectations,' <https://www.independent.ie/irish-news/politics/billions-on-retrofitting-old-houses-will-only-cut-emissions-by-a-fraction-of-expectations-38928163.html>

<sup>41</sup> SuperHomes, <https://superhomes.ie/>

<sup>42</sup> Fulcrum Bioenergy, <https://fulcrum-bioenergy.com/company/projects/>

<sup>43</sup> ECFD; Eurofuel; FuelsEurope; UPEi, *Heating with liquid fuels: pathway for a sustainable future*, [https://www.eurofuel.eu/images/Heating\\_with\\_liquid\\_fuels.pdf](https://www.eurofuel.eu/images/Heating_with_liquid_fuels.pdf)

<sup>44</sup> Neste, Neste's role in sustainable aviation, <https://www.neste.us/neste-my-renewable-jet-fuel/sustainable-aviation>

<sup>45</sup> NESTE, *Neste to supply KLM additional sustainable aviation fuel for flights out of Schiphol*, <https://www.neste.com/releases-and-news/aviation/neste-supply-klm-additional-sustainable-aviation-fuel-flights-out-schiphol>

<sup>46</sup> ECFD; Eurofuel; FuelsEurope; UPEi, *Heating with liquid fuels: A reliable heat supply for today and tomorrow*, <https://www.fuelseurope.eu/wp-content/uploads/2017/11/Heating-with-liquid-fuels.pdf>



**Powering the Aviation Sector. As an island economy containing key international airports connecting us to countries all across the world, the aviation sector is absolutely crucial to Ireland's present and future economic prosperity and social well-being.**

Without air travel, Ireland would be cut off from the world around us, just as individuals would be cut off from their families and friends living overseas.



As the world's population continues to grow rapidly and as millions more people enter the middle class annually, it is projected that the global aviation sector will grow rapidly in the coming decades.

The aircraft leasing sector is also important to Ireland. Over 60% of the world's leased aircraft are managed from Ireland, and the sector supports around 5,000 jobs in this country.<sup>47</sup>

The aviation sector is one of the fastest growing sources of emissions,<sup>48</sup> so finding ways to reduce emissions will be a major challenge in the coming years, particularly given that the sort of electric technology options which are used to power small vehicles are in their infancy in the aviation sector.

Nonetheless, the major advances which are being made in low carbon fuels for road transport provide evidence as to the solutions which can be found.

The same scientific innovation which is leading to the development of new fuels for road transport is also going to assist in the progressive decarbonisation of air transportation.

Innovative projects have already come to fruition, including the production of a jet fuel made from 100% waste and residue raw materials: a fuel which reduces greenhouse gas emissions by 80% compared to aviation fuels made from fossil fuels.<sup>49</sup>

Fuels for Ireland believes that low carbon liquid fuels such as this could be used to reduce 50% of CO<sub>2</sub> emissions in aviation by 2050.<sup>50</sup>

In addition, technological improvements in the field of aviation have already delivered impressive gains when it comes to fuel efficiency.

Thanks to this, the International Air Transport Association (IATA) was able to commit to an annual improvement in average fuel efficiency of 1.5% up to 2020, and is now aiming for a reduction in net aviation CO<sub>2</sub> emissions of 50% by 2050, relative to their 2005 level.<sup>51</sup>

Both of these elements - new low carbon fuels and improved fuel efficiency - have the capability to ensure that the increase in international air travel over the coming decades will not come at a cost to the planet which we all cherish.

<sup>47</sup> Aircraft Leasing Ireland IBEC, *Contribution to Irish economy*, [https://www.aircraftleasingireland.ie/Sectors/ALI/ALI.nsf/vPages/Aircraft\\_leasing\\_in\\_Ireland-contribution-to-irish-economy!OpenDocument](https://www.aircraftleasingireland.ie/Sectors/ALI/ALI.nsf/vPages/Aircraft_leasing_in_Ireland-contribution-to-irish-economy!OpenDocument)

<sup>48</sup> European Commission, *Reducing emissions from aviation*, [https://ec.europa.eu/clima/policies/transport/aviation\\_en](https://ec.europa.eu/clima/policies/transport/aviation_en)

<sup>49</sup> Neste, *Neste MY Renewable Jet Fuel*, <https://www.neste.com/companies/solutions/aviation>

<sup>50</sup> Board Approved High Level Statement on Vision 2050

<sup>51</sup> FuelsEurope, Vision 2050

**Powering the Maritime Sector. Just as Ireland cannot function effectively without air transport, the maritime sector is of paramount importance to a nation which depends on exports and imports to sustain our way of life.**

Irish ports handled more than 55 million tonnes of goods in 2018,<sup>52</sup> goods transported on ships travelling to and from all corners of the world.

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<sup>52</sup>. CSO, *Statistics of Port Traffic*, <https://www.cso.ie/en/releasesandpublications/er/spt/statisticsofporttraffic2018/>



Without liquid fuels, no such trips could be made, and this would have devastating effects on our economy and society.

Traditionally, it has proved difficult to reduce emissions and pollutants produced by shipping, due to the fact that ships tended to use heavier fuel oil which released large amounts of sulphur oxides (SOx) and other pollutants.

However, recent developments have shown that solutions are available and more will be coming online in the near future, as the shipping industry takes steps to reduce the environmental impact it has.

**In 2020, the International Maritime Organization has reduced the global upper limit for sulphur in ships' fuel oil from 3.5% to 0.5%: in certain controlled areas the limit has already been reduced even further to 0.1%.**

The decrease is expected to deliver a decrease in sulphur emissions from ships of around 8.5 million tonnes annually, thus improving air quality for everyone.<sup>53</sup>

In addition to reducing the toxic substances in shipping fuel, over the coming decades we are likely to see substantial changes in the types of fuel which are used to power the sector.

The rise of alternative shipping fuels has meant that biofuels and methanol are now available in some sectors, while there are now 300 ships in operation or on order which are fuelled using liquified natural gas.<sup>54</sup>

Further advances in low carbon liquid fuels will likely lead to a progressive increase in their use as part of shipping fuel, and this can help the industry to achieve 50% CO2 emission reductions in the maritime sector by 2050.

<sup>53</sup> IMO, *IMO 2020 - cleaner shipping for cleaner air*, <https://www.youtube.com/watch?v=Cr4KwOoLwzU&feature=youtu.be>

<sup>54</sup> SEA/LNG Ltd, *Comparison of alternative marine fuels*, [https://sea-lng.org/wp-content/uploads/2020/04/Alternative-Marine-Fuels-Study\\_final\\_report\\_25.09.19.pdf](https://sea-lng.org/wp-content/uploads/2020/04/Alternative-Marine-Fuels-Study_final_report_25.09.19.pdf)

**Commitments and Pathways. Making our industry carbon neutral by 2050 will be a massive challenge, and will require a range of steps by our members and all stakeholders in the energy field.**

As has been made clear, however, there are opportunities and pathways to make major progress in a short space of time in reducing emissions.



Concawe has been carrying out extensive and objective scientific research over the last half century on environmental issues relating to the industry.

To do this, it works with a range of industry sector organisations and international bodies, and the organisation also contributes to all EU Commission initiatives relevant to its field of activity.

The organisation has published a working plan titled 'The Low Carbon Pathways Project' which assesses the technological developments across different transport sectors that will contribute to the EU's decarbonisation goals. Concawe's analysis takes the 'Well-to-Wheels' approach in breaking down CO<sub>2</sub> emissions associated with transport into different stages. The 'Low Carbon Pathways' examines a range of steps which could be taken across a number of areas to reduce emissions substantially.<sup>55</sup>

#### Passenger Cars and Light Duty Commercial Vehicles

- Use of electric vehicles
- Development of hydrogen technology
- Increased use of biofuels and e-fuels produced from renewable electricity
- Engine improvements to improve the internal combustion engine
- Other vehicle improvements such as weight reduction and improved tyres

#### Heavy Duty Road Transport

- Greater optimisation of vehicle engines, trailers and tyres

- Increasing use of alternative fuels such as biofuels and natural gas
- Development of alternative fuels in the longer-term such as synthetic fuels or hydrogen

#### Aviation

- Continuation of gradual fuel efficiency gains which have been achieved in recent years
- Adoption of low-carbon liquid fuels, possibly including low-carbon intensity kerosene
- Improved technology including the development of sustainable low-carbon fuels

#### Maritime

- Design of new ships with improved hydrodynamics along with efficiency gains in engine and propulsion technologies.
- Formulation of marine diesels and the use of biofuels and e-fuels
- Employment of alternative fuels, particularly LNG and hydrogen

Similar pathways also exist when it comes to the home heating sector, where increases in efficiency and the integration of renewable sources can help smooth the way for a progressive increase in the use of low-carbon fuels and next generation bioliquids.<sup>56</sup> Fuels for Ireland will publish a detailed strategy on low carbon liquid fuels in the Irish heating sector late in 2020.

The pathways exist, but in order for Fuels for Ireland to develop them and meet the ambitious goal of making our sector carbon neutral by 2050, it will be vital to have the right policies in place at government level, just as it will be vital to have a collaborative approach with all stakeholders.

<sup>55</sup>. Concawe, *Working plan: The Low Carbon Pathways Project*, [https://www.concawe.eu/wp-content/uploads/2018/04/Working-plan\\_Low-Carbon-Pathways.pdf](https://www.concawe.eu/wp-content/uploads/2018/04/Working-plan_Low-Carbon-Pathways.pdf)

<sup>56</sup>. ECFD; Eurofuel; FuelsEurope; UPEi, *Heating with liquid fuels: A reliable heat supply for today and tomorrow*

# **Policy Needs. Reducing carbon emissions and tackling climate change is the greatest challenge we face in our industry, in our country and in our world.**

To meet it, we need the right policy approach. While each aspect of our overall strategy will be subject to review as technologies rapidly improve, there are certain guiding principles which if followed would be an enormous boost to our efforts to make our sector carbon neutral by 2050.



### Valuing a Diversified Approach

New technologies such as electric vehicles or electric heat pumps are a valuable part of the overall energy transition, and they will become even more important in the years to come. But given the wide-ranging energy needs of the population, they alone cannot fulfil the task of fuelling Ireland in a sustainable manner over the coming years. Low carbon liquid fuels and electrification are complementary, rather than being in competition with one another, and a strategy which employs a diversified approach is much more likely to deliver positive results.

### Technological Neutrality

The key goal for Fuels for Ireland is making our sector carbon neutral by 2050. Whether carbon reductions come about as a result of electrification or other innovations should not be the key consideration.

The key consideration should be: does this approach deliver the carbon reductions we need? There is no silver bullet when it comes to making our sector carbon neutral, and it is vital that policymakers consider a range of solutions, regardless of whether or not they rely exclusively on electrification.

### No Penalties Without Alternative

The Irish public is overwhelmingly supportive of moves to dramatically reduce our carbon footprint in order to preserve our environment and avert a climate catastrophe. However, policymakers need to consider the impact their decisions are having on citizens. In particular, they should not be enacting financial penalties in situations where alternatives (such as the use of alternative fuels or vehicles) are not available to people. That is why a diversified approach is crucial to meeting the diverse energy needs of the Irish people.

### Maintaining Dialogue With All Stakeholders

Fuels for Ireland intends to be proactive in making the necessary changes, rather than waiting for direction from others. However, it makes perfect sense to work with the Government and all other stakeholders and to communicate regularly about the policies which are working, and those which could be made to work better.

We share the same goals, and we will succeed - or fail - together. By entering into a continuous process of dialogue, our chances of meeting our ambitious goals and preserving Ireland's beautiful environment for generations to come will be greatly increased.





