Commission on Taxation & Welfare
An Coimisiún um Chánachas agus Leas

Briefing Paper

Environmental Taxes

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Author	Commission on Taxation and Welfare Secretariat
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Key points

- There are distinct challenges and opportunities for Ireland's transition to a carbon neutral and climate resilient economy and society, including the tension between the objectives of increasing economic growth and achieving net-zero emissions.
- Ireland's emissions targets will have a significant impact on public finances because they will either drive an increase in the level of public expenditure and investment required to make the change to lower emitting economy and society, or be required to cover the potentially significant cost of purchasing compliance and fines if the legally binding targets are not met.
- Alongside the many other non-tax measures to reduce emissions, environmental taxes have a role to either discourage environmentally damaging behaviour or encourage positive behaviour.
- Environmental taxes also provide an important revenue stream for the Exchequer and changes may be needed to ensure the longer-term sustainability of these receipts.
- Some existing tax expenditures and other direct fossil fuel subsidies may run counter to environmental goals and reducing emissions.

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1. Introduction

This paper follows the introductory discussions on environmental taxes at Meeting 4.

The purpose of the paper is to provide additional context for the Commission's work. It looks firstly at the distinct opportunities and challenges for Ireland in achieving emissions reductions, and then at the fiscal impact of Ireland's emissions reduction targets as well as the long term sustainability of environmental tax revenues.

2. Ireland: Challenges and Opportunities

As discussed in Meeting 4, Ireland's emissions profile is non typical compared to other EU Member States and within the OECD, in particular, the higher share of total GHG emissions from the agriculture sector.

It is therefore appropriate to consider the current Irish position and how being a small island nation with an export based economy may have implications for how Ireland can reduce greenhouse gas emissions and transition to a carbon neutral, climate resilient economy and society.

These features of the Irish economy and society may be viewed as challenges or opportunities and it is noted that tax is only one policy lever available to the Government to address them.

2.1 Economy

As highlighted in the latest OECD Environmental Performance Review, there is a strong link in Ireland between increased economic activity and increased GHG emissions. There is a therefore a potential tension between the objectives of increasing economic growth and reducing emissions.

For example, Ireland's economic model relies heavily on Foreign Direct Investment (FDI). The importance of FDI to the Irish economy is well established and significant, in terms of employment, tax revenue to the Exchequer and economic activity, however this reliance can present challenges in reaching emissions targets.

Data centres are an example of FDI activity with a particular emissions impact, which has been noted in the recently published Climate Action Plan 2021.[1]

[1] While data centres are set to become an increasing source of Ireland's energy demand, there is an opportunity to use the residual heat from data centres for district heating.
District heating is a system for distributing heat generated in a centralised location through a system of insulated pipes for residential and commercial heating requirements. Energy in the form of heat is produced centrally in

Agriculture is another important part of the Irish economy, accounting for 7% of employment (164,400 people), 4% of gross value added, and 10% of Irish merchandising exports (€14.5 billion value of total agricultural exports in 2019).[2]

However, the emissions impact of the agriculture sector is also significant – Ireland is unique among European countries in having agriculture as its largest sector for source of emissions at 35% in 2019, which may reflect the relatively lower level of manufacturing and industrial activity in Ireland compared to other countries.[3] 25% of Ireland's total GHG emissions are from methane and this primarily derives from the agriculture sector - a key driver of which is the increasing number of dairy cows (which increased by 40% between 2010 and 2020).[4]

Tourism is also a notable sector in terms of the environment as it relies on international visitors to Ireland by either sea or air and puts additional pressure on energy and water infrastructure. In 2018, revenue from overseas tourists exceeded €5 billion for the first time and the total value of tourism expenditure to the economy amounted to €9.4 billion, some 3% of GDP[5]. Tourism industries directly employ 225,500 people, accounting for around 10% of total employment.

2.2 Infrastructure and land use

Ireland is relatively unique in terms of its land use and low density large rural population, which necessarily has implications for the environmental impact of the energy and transport sectors, as well as housing. Changing demographics and increasing population size also pose additional challenges for these sectors.

Appropriate infrastructure is essential to achieving the changes required to reduce carbon emissions, for example charging points to support the use of electric vehicles and investment in retrofitting houses.

Project 2040 sets out the Government's long-term strategic infrastructure plan, combining the National Planning Framework and National Development Plan, with specific commitments in place longer term to assist the transition to lower emitting activities.

large plants, delivered through the district heating network and the usage is then metered at each building. District heating networks are completely fuel agnostic, as they can be driven by all manner of heating.

[2] DAFM Fact Sheet on Irish Agriculture; Central Statistics Office

[3] Environmental Protection Agency

[4] Environmental Protection Agency

[5] OECD, Tourism Trends and Policies, 2020

2.2.1 Transport

Transport is the second largest sector in terms of share of emissions in Ireland, accounting for 20% in 2019, with the overall share from transport having increased significantly (from 10% in 1990). Private cars accounted for 40% of transport final energy demand, followed by Heavy Good Vehicle freight at 14%.[6] Private cars accounted for 48% of overall transport emissions.[7]

Existing infrastructure challenges are relevant for considerations of the extent to which people can be expected to use alternatives to higher emitting activities – for example, using public transport or electric cars for everyday journeys outside the main urban areas.[8] In 2019, 84% of the population in rural areas relied on private passenger cars for transport, compared to 62% in densely populated areas.[9]

As of the start of 2021, the share of electric vehicles (EVs) and plug in hybrid electric vehicles (PHEVs) in Ireland was 10% of the total market, below the EU average of 14%. Uptake of new electric and hybrid cars has increased in the first half of 2021 (at 33% of the total new vehicles licensed compared with 19% in the same period in 2020).

Electric light commercial vehicles are available, and operators like An Post and Bus Éireann both have ambitions to fully electrify their fleets. However, there are limited alternatives to agricultural and heavy goods vehicles used by hauliers for transport of freight, including tractors and lorries. The main focus in this regard, as in the aviation sector, is on alternative more environmentally friendly, lower carbon fuels, including natural gas.

Some countries impose charges on heavy goods vehicles, for example Sweden and France, and other countries impose road tolls (France and Italy) and distance based charges for heavy goods vehicles (including Germany, Poland and Italy).[10] However, those counties have more viable alternatives for transporting freight, such as their rail networks.

As further outlined in Section 2.3 Ireland's geographical location means that transport is heavily reliant on road, sea and air.

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[6] SEAI, Data and Insights, Key Statistics: Transport (2018)
[7] EPA, Ireland's Environment (2020)
[8] Compared with other EU countries, Ireland has been catching up from a lower infrastructure base overall since the beginning of the Celtic tiger years and the distribution of the EU Structural Funds. To a certain extent it still suffers from an infrastructure deficit in certain transport areas such as the regional rail network.
[9] CSO, National Travel Survey (2019)
[10] Switzerland has the highest charge levels for distance based HGV tolls at €0.74 per km. Slovenia levies a charge of €0.53 per km and Hungary €0.49 per km. Charge levels are generally different between truck type and weight, and the emission standard of the truck; however distance based charges often do not differentiate between emission standard. European Union, Transport Taxes and Charges in Europe (July 2019)

2.2.2 Housing

The typical Irish home emits 58% more carbon than the EU average.[11] This is due to the fact that Irish homes are larger than the EU average and they tend to be heated by more carbon intensive fuels (such as oil and peat).[12]

While new builds must meet strict energy standards[13], a large majority of the existing building stock is still expected to be in active use by 2050. Efficiency upgrades and retrofits of the existing 1.7 million existing housing stock will therefore be required in order to meet Ireland's emissions targets.

One of the primary challenges is the financial constraint faced by households due to the upfront cost of such upgrades and retrofits, despite there being a long-term saving in terms of energy bills and lower total lifetime cost.[14] There is also competition with the new build sector for availability of labour, skills and resources to carry out such upgrades.

Further, 30% of private homes in Ireland are in the rental sector[15], with such homes being considerably less efficient than owner occupied properties.[16] There is a notable misalignment of incentives for energy efficiency in the rental sector, as the owners of the properties do not bear the cost of higher energy and heating bills, while the tenants who do bear those costs may not receive the longer term benefit of the upgrade.

2.2.3 Energy

The energy sector was responsible for almost 16% of emissions in 2019, the third largest in the State. This is slightly lower than the OECD average level of emissions. Energy tax receipts accounted for 5% of total tax revenue in 2017.[17] Due to the low rates applied, among the lowest in the EU[18], as well as the broad reliefs available, electricity tax receipts are very low.

Ireland's electricity policy plays an important part of Ireland's transition to a low carbon energy system as the increase in electricity generated from renewable sources would reduce emissions in the energy sector. It also has the potential to reduce emissions in the transport and heat sectors through

[11] SEAI, Energy in the Residential Sector (2018)
[12] SEAI, Energy in the Residential Sector (2018)
[13] A "nearly zero" energy performance standard.
[14] The average total capital cost to upgrade a home from an average BER rating of F to an average A3 rating is just over €60,000. SEAI, Key Findings Deep Retrofit Pilot Programme (2018)
[15] CSO, Housing in Ireland (Tenure & Rent) (2016)
[16] Almost 45% of rental properties in Ireland have a BER rating of D or lower with just under 5% of properties available to rent with a rating of A. CSO, The Rental Sector in Ireland (2021)
[17] CSO, Environmental Indicators 2019, Environmental Economy (2019)
[18] The average EU plus the UK rate applied to business users is €9 Mwh, with an average of €15.8 Mwh for non-business users. The UK rate for both business and non-business users is equivalent to €9.5/Mwh. The Netherlands apply the highest rate of €125/Mwh for both business and non-business users.

increased electrification of those sectors. The main challenge is therefore meeting increasing demand and ensuring security and reliability of supply, particularly in terms of storing renewable energy. Between 2016 and 2018, Ireland has become a net exporter of electricity.

In 2018, gas remained the largest input to electricity generation, providing just over half, although it is being phased out with the planned increases from renewable sources (22% in 2018). Coal and peat accounted for 21% in 2018 and oil has almost been fully phased out since 2011. The 2021 Climate Action Plan sets the proportion of renewable electricity at 80% by 2030.

2.3 Geography

As Ireland is a small island nation with an open export driven economy both the aviation and maritime sectors have a particular importance to Ireland from a practical and economic perspective.

The proposed revision of the Energy Tax Directive (ETD) provides specifically for the phasing out of the exemption for taxation on commercial aviation and maritime sectors. At the same time, Ireland's unique geography may have thus far untapped potential in terms of the greater provision of renewable energy through the production of green hydrogen[19] and offshore wind[20].

It is sometimes suggested that carbon sinks and carbon capture and storage through land use could be employed to help reduce Ireland's greenhouse emissions, for example, through afforestation, re-wetting peat and bog land, and re-wilding. However, this would not be of a scale sufficient to have a significant impact in reducing GHG emissions.[21]

Additionally, there is a limit on how much land may be used to achieve Ireland's EU non-ETS emissions targets.[22] Under the Land Use and Land Use Change and Forestry (LULUCF) regulation there is a binding commitment that emissions from land use are entirely compensated by an equivalent accounted removal of carbon dioxide from the atmosphere through action in this sector.[23] Ireland's land use

[19] Green hydrogen is a hydrogen-produced fuel obtained from electrolysis of water with electricity generated by low-carbon/renewable power sources.
[20] Offshore wind power or offshore wind energy is the deployment of wind farms sited in bodies of water. Higher wind speeds are available offshore compared to on land, so offshore farms' electricity generation is higher per amount of capacity installed.
[21] For example, re-wetting peatlands, which constitute 20% of Ireland's land, would only sequester 6 – 10 million tonnes of carbon dioxide a year. Ireland's greenhouse gas emissions for 2020 are estimated at 57.7 million tonnes of carbon dioxide equivalent so re-wetting the peatlands would only sequester approximately 10% – 17% of this. Environmental Protection Agency, Ireland's Provisional Greenhouse Gas Emissions (October 2021).
[22] The European Union has two categories of greenhouse gas emissions, the Emissions Trading System (ETS) greenhouse gas emissions, and the non-ETS greenhouse gas emissions. Emissions from agriculture, transport, the built environment and small industry are in the non-ETS sector. Emissions from electricity generation and large industry are in the ETS.
[23] For more information on the Land Use and Land Use Change and Forestry Regulation see here.

currently has positive emissions and consequently this means that there is not much scope to reduce other emissions through carbon capture and storage from land use.[24]

3. Fiscal impact

Ireland's legally binding emissions reductions targets will have a significant impact on public finances because they will either drive an increase in the level of public expenditure and investment required to make the change to lower emitting economy and society, or be needed to cover the cost of purchasing compliance and fines for not having met the targets.

Taxation is only one available policy lever and taxation measures, even when they are the appropriate action, cannot by themselves attain the required emissions reductions to achieve Ireland's 2030 emissions targets and net zero by 2050. Other policy levers and measures, such as: regulation; direct expenditure; market based measures; private investment; and research and development will also be required and are also currently being employed to successfully achieve emissions reductions.

Environmental tax measures have a role in changing behaviour. This can discourage environmentally harmful behaviour by adding a cost as a disincentive, or encourage positive behaviour through incentives or reliefs.

There is also scope to increase revenues from environment related taxes, at least in the short to medium term, in order to not only support a green and just transition but also support Exchequer revenue generally.

In their previous discussions, the members of the Commission on Taxation and Welfare considered the process for reviewing tax expenditures generally in the context of the Department of Finance Tax Expenditure Guidelines (at Meeting 5 and Meeting 10). The members of the Commission indicated they would be interested in potentially considering certain specific tax expenditures as well as the general process for reviewing them.

3.1.1 Tax expenditures

Tax expenditures can play both a negative and positive role for the environment by either subsidising fossil fuels and high emissions activities or providing an incentive to take up new more environmentally friendly lower emissions alternatives.

[24] Responsible for 7% of Ireland's total GHG emissions in 2018 accounting for 4.8 Mt of carbon dioxide equivalent. Ireland's emissions from the LULUCF sector are also higher than the EU average. As stated in the Climate Action Plan 2021.

The introduction of tax expenditures has a cost to the Exchequer and consideration should be given as to the timing of their eventual removal once a tipping point has been reached and the desirable behaviour is the norm or there is a viable alternative to the undesirable behaviour.

Three environmental tax expenditures are in the top 10 tax expenditures by cost in 2019 and 2020, ranking 1st, 6th and 8th in 2020 and previously ranking 4th, 5th and 6th in 2019.[25] These environmental tax expenditures are the:

- Excise rate on kerosene (which primarily has an impact on households);
- Reduced rate of excise on marked gas oil (which primarily has an impact on businesses); and,
- Excise rate on auto-diesel (which affects both households and businesses).

They accounted for 18% of the value of all tax expenditures in 2019 and 22% of the value of all tax expenditures in 2020.

In the case of these excise measures, the value of the tax expenditure is the difference between the excise duty collected in respect of a specific fuel and that tax revenue that would be collected if the excise duty on that fuel (in this case kerosene, marked gas oil and auto-diesel) was to be applied at the same rate as unleaded petrol.[26]

A new excise duty was introduced in 2001 on mineral oil. The ETD, which came into effect in 2003 sets minimum rates of excise duty with the intention of encouraging a low-carbon and energy efficient economy. Member states design their own taxes within the framework of the ETD and can determine domestic rates if they meet the ETD minimum.[27] This means that the rates of excise applied are still at least the minimum provided for by the ETD. In Budget 2010, a carbon tax component was added to the excise duty applied to fuel as well.

The below table sets out rates of excise applicable to these different fuels[28]

[25] There was a significant change in the cost of the lower rate of excise on kerosene between 2019 and 2020. As kerosene is mainly used as a heating fuel, this is most likely due to the emergence of remote working/working from home as a result of the Covid-19 pandemic. Similarly, there was also a significant change in the cost of the lower excise rate on auto-diesel due to the fact that people were driving less due to lockdown restrictions and the emergence of working from home in some sectors. Department of Finance, Budget 2022 Report on Tax Expenditures, October 2021.

[26] Unleaded petrol is used as the benchmark. The highest rate of excise on mineral oils is applied to unleaded petrol.

[27] For the full table of applicable excise rates on different fuels applied by each Member State under the Energy Tax Directive, see here. Effective from July 2021.

[28] Note this focuses on excise and therefore does not include the carbon tax component of the Mineral Oil Tax.

Table 1 Rates of excise applied to different fuels in Ireland

Fuel	€ per 1,000 litres	Energy Tax Directive Minimum
Unleaded Petrol (benchmark)	€541.84	€359
Diesel	€425.72	€330 (motor fuels)
Kerosene (other than used as a propellant i.e. home heating oil)	€0	€0 (rate for non-business, used for heat and electricity)
Marked Gas Oil	€47.36	€21 (motor fuels used for commercial and industrial use)

Source: Revenue

The main policy rationale for the introduction of these tax expenditures was to provide support for individuals and sectors where there was not an alternative option to heat their homes and run their businesses and consequently, no means for them to change their behaviour. It may be worth reconsidering whether this policy rationale is still as valid and compelling in all cases, given developments in technology and the emergence of feasible alternatives.

Reduced rate of excise on kerosene

Individuals and households typically benefit from this lower rate of excise, as Kerosene is primarily used for home heating, and is also referred to as home heating oil.

The rationale behind the reduced rate of excise on kerosene is to protect those on low incomes and this measure is especially targeted at those who are vulnerable to fuel poverty as well as intended generally to minimise household energy and heating costs.[29] Ireland has a comparatively high dependence on oil (kerosene and marked gas oil) for home heating[30], with 40% of homes heated with oil[31].

The rate of excise duty applied to kerosene is much lower than the rate of excise duty applied to petrol and diesel resulting in an estimated €680.9 million of revenue foregone in 2020.[32]

[29] See 2009, 2010, 2012 Energy and Environmental Taxes TSG Papers, available here. Fuel Poverty may be defined as when a household spends more than 10% of net income, excluding housing costs, on fuel costs. O'Meara, A Review of the Literature on Fuel Poverty with a Focus on Ireland (July 2015)

[30] Eurostat

[31] CSO, Regional SDGS Ireland 2017 Environment (2017)

[32] Department of Finance, Budget 2022 Report on Tax Expenditures, October 2021

Reduced rate of excise on marked gas oil (MGO)

Businesses typically benefit from this lower rate of excise duty. MGO is diesel on which a reduced rate of excise duty (mineral oil tax) is applied on the condition that it is only used for specific purposes - heating, agriculture, and in the marine and rail sectors.

The rationale behind this measure is to provide sector specific supports to particular industries, in this case the primary sectors including agriculture, fishing and forestry. It is intended to protect the competitiveness of such businesses which are reliant on diesel and without any real alternatives.

This resulted in an estimated cost to the Exchequer of €488.3 million in 2020[33] and the revenue foregone due to the lower excise duty on marked gas oil represents 14% of total indirect subsidies.[34]

Reduced rate of excise on auto diesel

The reduced rate of excise on diesel when compared with petrol was originally intended as a measure to support businesses reliant on diesel. However, as it was not targeted, individuals and private motorists are also able to benefit from the lower rate of excise. This resulted in a significant increase in the use of diesel cars by this cohort.

Fuel excise duty is applied at a lower rate to auto-diesel than petrol accounting for €366.1 million in revenue forgone in 2020.[35]

The Climate Change Advisory Council, the European Commission and the OECD have all called on Ireland to equalise the rate of excise on diesel and petrol. One of the actions contained in the Climate Action Plan 2021 is to "examine options for the equalisation of diesel and petrol excise rates over an appropriate period of time". See Section 3.3.5 for more information on this.

The following tables summarise other environmental related tax expenditures:

[33] Department of Finance, Budget 2022 Report on Tax Expenditures, October 2021
[34] CSO Statistical Release, Fossil Fuel Subsidies 2019 (2019)
[35] Department of Finance, Budget 2022 Report on Tax Expenditures, October 2021

Table 2 Environment Related Tax Expenditures – aimed at businesses

Tax Expenditure	Description	Claims/Number Utilising and Cost
Diesel Rebate Scheme and VAT Refund Scheme	This measure is intended to support road haulage operators and passenger transport operators, recognising the lack of alternatives to these diesel vehicles as present. The scheme provides for the repayment of some of the mineral oil tax paid on diesel purchased by a business within the State for use in qualifying motor vehicles and in respect of qualifying road transport in the course of business transport activities.	855 claims paid; €8.2 million in revenue foregone
Excise Rate applied to Fuel Oil (Sections 94 – 109 Finance Act 1999)	This measure supports the manufacturing of alumina, which uses high quantities of fuel oil in the industrial process. A reduced rate of excise is applied to the fuel oil that is used in connection with the manufacturing of alumina.	€24.9 million
Commercial Sea Navigation	This is to support the maritime sector, recognising the lack of alternatives for boats and ships and the importance of the maritime and fishing industry for Ireland as an island. It provides for the repayment of Mineral Oil Tax on mineral oil used for the purpose of commercial sea navigation, including sea-fishing.	€16.6 million
Accelerated Capital Allowances for Energy-Efficient Equipment	The purpose of this relief is to encourage businesses to invest in energy efficient equipment. A deduction for the cost of the equipment may be claimed in the year of purchase rather than over the usual 8 year period for specified energy efficient equipment including electric and alternative fuel vehicles, gas vehicles and refuelling equipment. There is a limit of €24,000 for an electric vehicle.	€3.7 million; 776 claims (2018)

Department of Finance, Budget 2022 Report on Tax Expenditures 2021 (October 2021)

Table 3 **Environment Related Tax Expenditures – aimed at individuals**

Tax Expenditure	Description	Claims/Number Utilising and Cost
Relief from VRT for electric and hybrid vehicles	This relief reduces the upfront cost of an electric or hybrid vehicle, as an alternative to a higher emitting vehicle. VRT relief is provided for electric and hybrid vehicles of up to €5,000.	25,943 utilised; €38.7 million

Department of Finance, Budget 2022 Report on Tax Expenditures 2021 (October 2021)

3.1.2 Fossil fuel subsidies

Some of the above tax expenditures may be classed as fossil fuel subsidies - conferring an advantage on certain fossil fuel products through the tax code.[36] Direct fossil fuel subsidies may also be of relevance to the discussion of tax expenditures as they themselves also have a significant Exchequer cost. This includes items like the Public Service Obligation (PSO) levy and household energy allowances like the fuel allowance.

Fossil fuel subsidies granted through the tax code may run contrary to the objective of reducing GHG emissions[37], as they are subsidising the cost of the GHG emitting fossil fuel sectors business, either directly or indirectly.

At the same time, many of the tax measures that may be characterised as fossil fuel subsidies are intended to support vulnerable individuals and businesses. How these other policy aims can be also met and aligned with environmental policy goals is an important element of ensuring and achieving a just transition (for more detail on the just transition, see below at section 3.4).

The revised ETD proposes among other things that tax fossil fuel subsidies be phased out over the period 2023 – 2033. The Commission may wish to consider the best means for achieving this in their recommendations.

[36] The CSO estimate the total fossil fuel subsidies amounted to €2.4 billion in 2019 with direct fossil fuel subsidies accounting for 11% of total fossil fuel subsidies, the lower excise duty on auto diesel accounted for 19% of total indirect subsidies. This compares to €3 billion raised in energy taxes and an expenditure of €0.4 billion on environmental subsidies related to energy and emissions.

[37] According to the Environmental Pillar, removing fossil fuel subsidies could reduce economy-wide carbon dioxide emissions by 20 per cent by 2030 compared to a business as usual scenario.

3.1.3 Other measures in the tax code related to the environment and green budgeting

As previously indicated, environmental measures may be negative, providing a disincentive to undesirable behaviour, or positive, aiming to encourage positive behaviour.

As set out in Appendix 1 of the introductory paper on environmental taxation, beyond the tax expenditures and fossil fuel subsidies referenced above, there are a number of other measures in the tax code, that may be considered to have an environmental impact even if not directly. Examples include:

- Tax incentives to promote the uptake of electric vehicles including VRT relief and Benefit-in-Kind Exemptions (such as the Cycle-to-Work scheme or the Travel Pass scheme);
- General tax deductions that cover motor vehicles (diesel and petrol cars) used for business purposes;
- VAT rebate on commercial fuel use;
- Income tax relief for farmers, including stock relief;
- Income tax relief under the Employment Investment Incentive Scheme for investment in companies generating renewable electricity;
- Electricity tax relief claimed at source for the supplier for electricity generated from renewable sources or produced from environmentally friendly heat and power cogeneration.

These other measures in the tax code serve multiple purposes and may have other policy aims, separate to their environmental impact. Consequently, it may not also be appropriate to consider them on an environmental basis alone.

The green budgeting approach is perhaps a better means of evaluating such measures as it allows for the benchmarking of policy measures beyond those which have a specific environmental aim but which nevertheless have implications for the environment and greenhouse gas emissions.

In the same way that the annual Budget considers the fiscal impact of new and modified existing measures to determine the overall financial positon of the State, green budgeting involves a consideration of all budgetary and fiscal measures from an environmental perspective to determine whether such measures have an environmentally positive or negative impact. The Department of Finance is actively engaging in green budgeting.[38] Additionally, in the context of the wider work of the

[38] Department of Finance, Budget 2022 A Review of Green Budgeting from a Tax Perspective (October 2021). "Green budgeting establishes a methodology by which governments can measure and design fiscal policy, including tax and expenditure measures, to influence individual and business behaviours towards supporting climate and environmental goals and to influence behaviour away from harmful climate and environmental activities."

Commission, consideration may be given to how the environmental impact of tax expenditures may be included in the process for assessing and reviewing tax expenditures.

3.2 Cost of not meeting EU emissions targets; level of investment required

There are significant costs to Ireland of not meeting EU emissions targets, as well as considerable levels of public funding and investment required in order to achieve them. Whether or not Ireland meets its emissions targets, there will be an important impact on the public finances.

2020 targets

Ireland had to pay €150 million to purchase compensatory carbon credits, as well as paying an additional €125 million in fines for not meeting the 2020 EU climate targets.

2030 targets

The picture is much more complex in the case of 2030 targets and any estimate of the projected compliance cost is highly speculative.[39]

However, it has been estimated that if none of the actions in the 2019 Climate Action Plan were to be progressed, Ireland could face a compliance cost in the range of €1.46 billion to €1.75 billion to 2030. This cost is estimated on a cumulative basis and a portion of this will be borne annually.[40]

3.3 Sustainability

Taxes can be levied in such a way as to encourage a change in behaviour. Similar to the operation of "sin taxes" on alcohol and tobacco, the effective application of environmental taxes has the potential to discourage environmentally harmful behaviours.

A consequence of such a policy being successful is that, without modifications, the revenue stream may not be sustainable as the desired behavioural change will result in a decrease in tax revenue.

It is for this reason that it has been suggested that the short-term revenue generated from changes to environmental taxes be ring-fenced for specific purposes, including the once-off costs of the investment required to transition to a low carbon economy and society. This is discussed further below in Section 3.4 on the main just transition measures.

[39] If Ireland fails to reduce emissions in line with the linear trajectory required under the effort sharing directive, Ireland will have to purchase compliance from Member States who have overachieved on their annual targets. Currently, such carbon credits to purchase compliance are readily available and cheap. However, overachievement cannot be carried forward and as Member States have more stringent 2030 targets there is no guarantee there will be a surplus available for sale and consequently carbon credits may become extremely expensive increasing the cost of compliance significantly.

[40] DPER Briefing Note: Compliance Cost associated with 2020 & 2030 Climate & Energy Targets (March 2020)

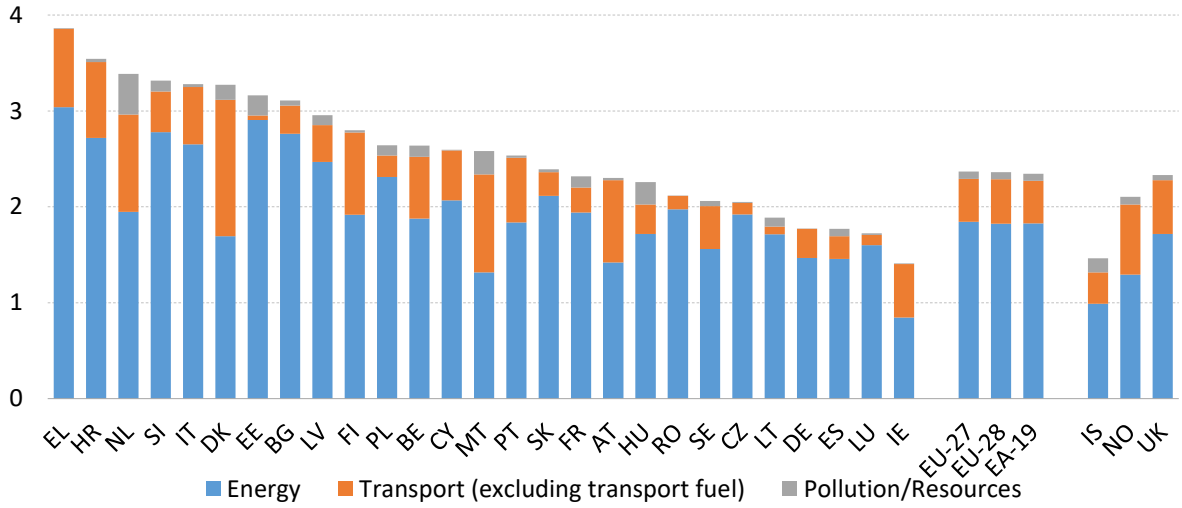
Notwithstanding the use of tax to change behaviours, taxes are levied primarily to provide a source of revenue to fund State services overall. In that regard, it is noted that environmental taxes typically contribute around €5 billion per year to the Exchequer and account for around 6% - 8% of total taxes.[41]

This raises the question of how to ensure the longer-term sustainability of environmental taxes as a reliable source of Exchequer revenue, which may require well-timed modifications to existing taxes, or the introduction of alternative sources of tax revenue.

3.3.1 How Ireland compares overall

Ireland is one of just five EU member states where energy tax revenues are below 2% of GDP[42] (with Germany, Spain, Austria and Malta being the other four), see Figure 1 below. These figures reflect the proportion of energy tax revenues compared to GDP as well as different rates of excise by Member States.

Figure 1 Structure of Environmental Taxes (% of GDP) 2019



Source: European Commission, DG Taxation and Customs Union, based on Eurostat data

Ireland is consistently slightly above the European average in terms of the amount of environmental tax revenues raised as a proportion of total taxes and social contributions.

Compared with other EU Member States, Ireland receives below average revenues from energy taxes and taxes on pollution/resources, but above average revenues from transport:

[41] CSO Statistical Release Environment Taxes, (July 2021)

[42] As previously indicated, GDP is not the best comparator in Ireland's case as it does not fully reflect Ireland's national/domestic economic activity.

Table 4 Environmental tax revenues from energy taxes, transport taxes and taxes on pollution/resources as a proportional of total environmental tax revenues (2019)[43]

Environmental Tax	Ireland	EU27	EU28	EA19
Energy	60.07%	77.9%	77.27%	77.89%
Transport	39.54%	18.89%	19.66%	18.94%
Pollution/Resources	0.39%	3.21%	3.08%	3.17%

Source: Eurostat (Taxes - € million)

More detail on revenue sources that have been identified for further discussion are set out below.

3.3.2 Vehicle Taxes

The motor tax regime currently provides the second largest source of environmental tax revenue, after energy taxes[44] and is based on CO_2 emissions levels[45] providing a fiscal incentive to motorists to acquire lowering emitting vehicles.

As technology has improved in recent years and average emissions from cars have been reduced, with 56% of cars in the lowest emitting band (A) in 2018, compared to only 8% in 2008, so too have Motor Tax liabilities with the average being €367 per car in 2019 when it was €466 per car in 2014. As a result, Motor Tax receipts have also declined from €905 million in 2014 to €772 million in 2018, even though the numbers of cars have increased.[46] The Parliamentary Budget Office have projected that revenues will continue to decline to €687 million by 2023. The emissions based system will also be challenged by the emergence of electric vehicles that are at the lowest tax band for Motor Tax.

Vehicle registration tax (VRT) is a transactional tax, based on the purchase of a car and consequently it tends to follow the economic cycle as a result. The changes to VRT in Budget 2022[47] are intended to

[43] Environmental taxes are defined for statistical purposes by Eurostat.
Energy taxes include: energy products for transport purposes, energy products for stationary purposes, electricity consumption and production, district heat consumption and production, carbon content of fuels and emissions of greenhouse gases.
Transport taxes include: motor vehicle taxes on import or sale (one off), registration or use of motor vehicles (recurrent), road use, congestion charges and city tolls, taxes on other means of transport (ships, airplanes, railways), flights and flight tickets, vehicle insurance (excluding general insurance taxes).
Pollution taxes include: taxes on NO_X and SO_X emissions, other emissions, ozone depleting substances, effluents to water, pesticides, artificial fertilisers (based on phosphorus or nitrogen content or price), manure, waste management, resources including water abstraction, harvesting of biological resources, extraction of raw minerals, landscape changes and cutting of trees.
[44] CSO, Environmental Taxes 2019 (2019)
[45] For cars registered since 2008.
[46] Parliamentary Budget Office, An Analysis of the Sustainability of VRT and Motor Tax (2019) based on 2019 TSG Paper; CSO, Environment Taxes by Tax Type 2010 - 2019 (July 2020)
[47] A new 20-band table replacing the previous 11 band version was introduced. This allows for a more graduated approach to VRT distribution, and is more in line with the polluter-pays principle. The VRT rates range was

increase the difference in cost between low emissions vehicles and other vehicles creating an incentive for those purchasing a car to choose a low emission vehicle. The new VRT rates increase progressively from band 9 to 20 so that high emission vehicles are disincentivised most. This is supported by the fact that electric and hybrid cars are continuing to increase in popularity constituting 32% of all new cars licenced in the first half of 2021 (up from 19% in the first half of 2020).[48]

The Climate Action Plan 2021 contains a commitment to examine the introduction of an emissions-based tax regime for light goods vehicles. The Department of Finance Tax Strategy Group paper sets out two possible options for an emissions based system for such commercial vehicles. The first option is a banded system for determining VRT where vehicles are classified based on the level of carbon dioxide emissions within a range (the bands) and a lower rate of VRT is applied to vehicles in a lower band. However, this does not recognise the fact that there are few alternatives to larger vans to meet business needs. The second option is providing a discounted (lower) level of VRT to lower emissions vehicles while retaining the current level of VRT at 13% of the open market selling price (OMSP).

The scale of electrification of the national car fleet will further bring Exchequer risks to other taxes – it is estimated that if the Climate Action Plan 2019 target of 840,000 electric passenger cars on the road by 2030 is reached the Exchequer will lose approximately €1.5 billion worth of revenue annually from motor tax, VAT and fuel excise.[49]

Motor taxes were previously based on engine size which reflected the impact their road usage had on the cost of building and maintaining roads infrastructure. This was amended in July 2008 when the emissions based system was introduced. Given the transition to electric and low/zero emissions vehicles, consideration may need to be given to whether there should be a similar adjustment of the motor tax regime. The scale and timing of any such adjustments would be a relevant consideration, to not discourage the continued green transition in the transport sector.

Consideration could also be given to other motor related measures which could be introduced in addition to a revised motor tax regime or as an alternative. Other motor tax measures which are not directly based on emissions levels of vehicles include a charge based on road usage, a once-off non-emissions based registration charge, a recurring annual charge on cars depending on engine size or

changed from 14%-36% to 7%-37%; this significant widening of the rates gap provides a strong environmental rationale to the system and rewards ultra-low emission vehicles (ULEV) with reduced VRT.

[48] CSO Statistical Release, Vehicles licensed for the first time (July 2021)

[49] DPER Spending Review 2019, Incentives for personal Electric Vehicle Purchase (2019)

miles travelled and congestion charges. Such general transport taxes exist in a number of other countries[50] - see Appendix 4 for more details.

3.3.3 Levy on emissions: carbon tax

The carbon tax is one of the key environmental taxation measures in Ireland and is set to increase to €100/tonne of carbon dioxide by 2030, with annual incremental increases to that level provided for in legislation[51]. An increase of 10% to the carbon tax would yield €138 million.[52]

The following sets out the current carbon tax increases up to 2030:

Table 5 Rate of Carbon Tax per Tonne of Carbon Dioxide

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029
Price	€33.50	€41	€48.50	€56	€63.50	€71	€78.50	€86	€93.50

Source: Finance Act 2020

The table below shows the estimated impact of the planned annual carbon tax increase over the next 8 years based on the current price of a typical fuel bundle for each of the fuel types below. [53]

Table 6 Cost of a Typical Fuel Bundle – impact of carbon tax increases

	2021	2022	2023	2024	2025	2026	2027	2028	2029
Petrol	€98.76	€100.04	€101.32	€102.6	€103.88	€105.16	€106.44	€107.72	€109
Diesel	€93.96	€95.44	€96.92	€98.4	€99.88	€101.36	€102.84	€104.32	€105.8
Kerosene	€612	€631.4	€650.8	€670.2	€689.6	€709	€728.4	€747.8	€767.2
Natural Gas	€781	€797.85	€814.7	€831.55	€848.4	€865.25	€882.1	€898.95	€915.8
Peat	€5.51	€5.71	€5.91	€6.11	€6.31	€6.51	€6.71	€6.91	€7.11
Coal	€21	€21.89	€22.78	€23.67	€24.56	€25.45	€26.34	€27.23	€28.12

Source: Budget 2022 - A Citizen's Guide (Link to Guide at bottom of page)

The policy may be relatively settled, but there is a possibility to increase the rate of the carbon tax more quickly than is currently provided with the aim of effecting the intended behavioural change and associated emissions reductions sooner. It also has the possibility of a quicker increase in the yield from the tax to provide funds for the transition to a lower carbon society.

[50] For example, Germany, the Netherlands, Portugal, Estonia and Lithuania.
[51] Finance Act 2020
[52] ESRI, Options for Raising Tax Revenue in Ireland Budget Perspectives 2022 (May 2021)
[53] Budget 2022 - A Citizen's Guide

However, increasing the rate of carbon tax sooner may not have an equivalent impact on behavioural change as people's ability to change their behaviour and their demand for energy and transport are fairly inelastic so behavioural change will depend on the individual circumstances and situations of people. Consequently, people could end up paying more instead. This has implications for the just transition, as well as the use of carbon tax funds to support this.

As discussed above, the additional receipts from the increases to the carbon tax have been ring-fenced to protect the most vulnerable in society from the otherwise regressive impact of the increases in the carbon tax. ESRI analysis found that the net impact of the latest carbon tax increase, combined with compensatory welfare package announced up until 2021 is progressive, and that households in the bottom four income deciles will see all of the cost of the carbon tax increase offset.

3.3.4 Levy on emissions: methane

At the UN climate change Conference of the Parties 26 (COP 26), in November 2021, the Taoiseach stated that Ireland will sign up to a global pledge to reduce methane emission by 2030.

Methane mitigation on a global/worldwide level has been acknowledged as a significant contributor to achieving emissions reductions targets.[54] Methane is a short-lived climate pollutant, with an atmospheric lifetime of roughly a decade and is tens of times more powerful than carbon dioxide at warming the atmosphere.[55]

Despite this, no country in the world currently has a tax on biogenic methane.

If such a tax were to be introduced, this would almost exclusively target the agricultural sector as agriculture is mainly responsible for methane emissions. Such a charge would therefore not be straightforward in Ireland:

- Introducing a tax on emissions arising from the agriculture sector was a recommendation put forward by the Citizens Assembly on Climate Change.[56] This was strongly criticised by agricultural and farm representative organisations, including the Irish Farmers' Association.

[54] The Paris Agreement's goal of limiting global warming to 1.5 degrees Celsius cannot be reasonably achieved without reducing methane emissions by 40% – 45% by 2030. Given methane's short atmospheric lifetime, this means that action taken now can quickly reduce atmospheric concentrations and rapidly reduce the rate of global warming.

[55] UN Environment Programme Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions (May 2021)

[56] 89% of the Members recommended that there should be a tax on greenhouse gas (GHG) emissions from agriculture. There should be rewards for the farmer for land management that sequesters carbon. Any resulting revenue should be reinvested to support climate friendly agricultural practices

- New Zealand has a similar emissions profile to Ireland, with agriculture also being the highest emitting sector there as well as being a similarly important part of their economy. They have recently introduced a Climate Change Response (Zero Carbon) Amendment Bill which aims to implement a separate target to reduce emissions of biogenic methane by 10% by 2030, and 24-47% by 2050 (relative to 2017 levels).[57] Much like Ireland's Climate Action and Low Carbon Development (Amendment) Act, New Zealand's bill provides for the introduction of "emissions budgets" and requires the relevant Government Ministers to prepare and publish plans outlining policies and strategies for achieving their targets within the emissions budgets, and these policies and strategies will not necessarily just be tax measures.

Although the taxation of methane could constitute a direct incentive for the agriculture sector to change their behaviour subject to viable alternatives being available, that sector could be disproportionately impacted. It is also likely that the increased cost of production would be passed on to end consumers, including lower income households in Ireland who typically pay proportionately more of their income towards agricultural products, including meat and dairy.

3.3.5 Diesel excise gap

Auto-diesel is the predominant road transport fuel in use in Ireland.

As noted above, the rate of excise applied to auto diesel is lower than that currently applied to petrol. As a result, the majority of new car purchases in Ireland are diesel, considerably above the EU average.[58] Consequently, as noted above, there have been many calls to equalise the excise rate of diesel and petrol.

As also noted above, the differential in rates was originally intended as a measure to support businesses[59]; however, it has had a significant impact on behaviour in terms of the use and ownership of diesel cars.

The Department of Finance Tax Strategy Group Paper sets out a pathway for equalisation by increasing diesel excise by around 2 cent per year over a period of 5 years, or just over 1 cent/per litre/per year over 10 years.[60] Previous studies indicate equalising the rate of excise on petrol and diesel could

[57] These targets reflect that reducing methane emissions has a strong cooling effect but are less stringent [initially] compared to other GHG targets also reflecting the importance of the agriculture sector and was generally welcomed by the dairy industry, with some disagreement as to the level of reductions required.
[58] CSO, Vehicles registered for the first time (April 2021)
[59] The rationale for this is that diesel is primarily the fuel used by business and particularly heavy goods haulage; the lower rate of excise is a policy that is intended to protect the competiveness of businesses reliant on diesel. However, diesel emits higher levels of NOx compared to petrol as well as particulate matter and the calls for equalisation are based on environmental and public health grounds.
[60] Department of Finance, Tax Strategy Group Paper TSG 21 - 09 "Climate Action and Tax" (September 2021)

reduce Irish carbon emissions by up to 7% and raise an estimated additional €65 million of revenue for the Exchequer annually.[61]

3.3.6 Other potential sources of environmental taxes

As noted above (in Section 3.3.2), there is a need to consider sources of environmental tax revenues and what new bases of taxation may be required beyond the process of the green transition and in a carbon neutral economy. Some potential options in this regard are explored below.

Electricity

Ireland has a very low rate of tax on electricity and there is relief from tax on electricity used by households, as well as a number of other reliefs, principally for electricity generated from renewable sources. This presents both an opportunity and a risk in terms of environmental tax revenues as there is potentially scope to gain additional revenue through increasing the rate of electricity tax but currently as the share of electricity that is generated from renewable sources increases, so too does the tax relief that is available, reducing the overall tax yield.

The revised ETD proposes a gradual removal of the relief from electricity tax for electricity used by households (see Appendix 2 for more detail).

Generally increasing the rate to €2 per MWh would generate an estimate additional annual yield to the Exchequer of €5 million and increasing the rate to €10 per MWh would generate an estimated additional annual yield to the Exchequer of €50 million.

Removing the electricity tax household relief at the current rate would result in an additional annual yield of €3.5 million to the Exchequer, whereas removing the electricity tax household relief and increasing the rate to €10 per MWh would result in an estimated additional annual yield of €35 million to the Exchequer.

The potential impact of additional electricity tax is something that could be considered. For example, the fact that this may adversely affect low income and vulnerable individuals and households, particularly as electricity is intended to pay an even more important part in people's daily lives through heating their homes (heat pumps) and transport (electric vehicles). The estimated impact on the average annual household bill of removing the electricity tax relief on households would be €4.77, while the impact on the average annual household bill of removing the household rate and increasing the rate to €10 per MWh would be an additional cost of €47.67.[62]

[61] Department of Finance, Tax Strategy Group Paper TSG 21 - 09 "Climate Action and Tax" (September 2021)
[62] Tax Strategy Group Paper.

Gas

Gas is one of the fuels covered by the EU ETD, which provides a minimum rate of excise duty that must be applied.[63]

For most fuels, Ireland taxes above this minimum level (see Table 1 in Section 3.1.1).[64] Where natural gas is used in a motor vehicle (used as propellant) only the minimum rate is applied to encourage the use of lower carbon technologies, such as gas, in transport. For this reason, in 2016 the Government committed to freezing the rate of tax applied to natural gas used as a propellant until 2025.

The current proposed revisions to the ETD provide for an increase to the minimum rate of taxation, including on gas used as a propellant.[65]

Biofuels

The proposed revision of the ETD under the Fit for 55 legislative package[66] provides for minimum rates on energy to be based on energy content and environmental performance rather than volume. Additionally, the reform of the Energy Tax Directive includes the taxation of new fuels, such as biofuels and hydrogen.

Biofuel is a fuel that is produced from living matter (biomass) - either plants or animals.[67] Green hydrogen is hydrogen that is generated by the electrolysis (splitting) of water using electricity generated from renewable/low carbon sources.

Both of these sources of energy provide a particular opportunity for Ireland as Ireland is well-placed to produce green hydrogen and also Ireland's agricultural sector can play an important role in the production of biofuels. For example, methane may be used as a biofuel (a biogas). There is also the opportunity to for farms to generate renewable energy on a small scale by placing solar panels and/or wind turbines on their farmland.

[63] For details, see here and here.
[64] €2.60 per Gigajoule of energy released. The minimum for natural gas used as heating fuel for business use is €0.15 per unit of energy and for non-business use is €0.3 per unit of energy and Ireland applies a carbon tax of €1.68 per Gigajoule in both cases, providing a benefit to businesses in terms of their heating costs. European Commission, Excise Duty Tables Part II Energy products and Electricity (as at July 2021)
[65] From €2.60 per Gigajoule to €7.17 per Gigajoule in 2023 and up to €10.75 per Gigajoule in 2033.
[66] The European Green Deal is the European Commission's policy initiative which has the aim of making Europe 'climate neutral' by 2020. The Fit for 55 package contains legislative reforms to meet the increased 55% emissions reduction target which the EU has set for 2030.
[67] Ireland introduced the Biofuels Obligation Scheme in 2010 and since 2019 the Scheme has required that 10% (by volume) of motor fuels, typically diesel and petrol, placed on the Irish market have to be produced from renewable sources (such as ethanol and biodiesel).

3.3.7 Environment related alternative sources of revenue

Congestion Charges

Congestion charges or congestion pricing is a surcharge on the use of roads, particularly in cities. Generally, their aim is primarily to generate revenue intended to pay for road infrastructure as well as addressing the negative externalities associated with road travel such as air pollution, greenhouse gas emissions, noise pollution and road traffic collision. Some notable examples include congestion charges in London, Stockholm, and Milan.[68] For example, in the case of London, the congestion charge is applied at a daily rate of £15 per day for cars driving in the congestion charge zone. The congestion charge yields around £232 million per annum.[69]

Additionally, related to congestion charges, another policy option is a low emission zone where the vehicle levy is based on how polluting a vehicle in the city centre is rather than simply its physical presence in the area. London also has also employed an Ultra Low Emissions Zone (ULEZ) in tandem with the congestion charge.

City Tax

A local tax, or city tax, is a general tax that may be levied by a municipality to fund public services. This is generally applied to tourists. It can also be referred to as a transient visitor levy.

It is intended to address the negative impacts of tourism, such as aviation emissions, as well as impacts on infrastructure as well as the environmental impacts on local environments and ecosystem as well as historical and cultural sites.

There are currently 19 such taxes in operation across Europe, including in Amsterdam, Dubrovnik, Florence and Geneva. For example, Amsterdam has a flat fee of €3 per person per night for any visitor, as well as a 7% city tax. Rome applies a city tax on all hotels requiring a contribution of €4 per person per night for 2 and 3 star hotels, €6 per person per night for 4 star hotels and €7 per person for night for 5 star hotels.

Ireland does not currently have such a tax in place and given the importance of the tourism industry for Ireland's economy, this could be considered as an alternative source of environmentally related revenue.[70]

[68] For more information on schemes see here. This indicates that Ireland is somewhat of an outlier and unusual in the fact that it does not really have any urban access rules. The main one of note is Dublin City Council's ban on heavy goods vehicles.
[69] https://www.london.gov.uk/questions/2021/0586
[70] See here for an analysis of the possibility of introducing a Tourist Duty in Scotland.

Water Charges

The previous Commission on Taxation recommended the introduction of a water charge. This was on the basis that the cost of providing water supply and water treatment to ensure high quality drinking water is currently funded out of general taxation and the Commission held the view that it was unlikely that Ireland could maintain the required level of expenditure for this from general taxation. This includes the cost meeting requirements in terms of water quality set at an EU level, under the Water Framework Directive.

While the proposed water changes came under the environmental remit and the green economy, the primary motivation of the previous Commission was revenue raising. Additionally, given that households do not pay a charge for water, there is no incentive to conserve water based on the cost of use.

The OECD, in its environmental performance review, also recommended the introduction of water charges. This recommendation also had the rational of revenue raising and ensuring adequacy of funding.[71]

3.4 Main Just Transition measures

As discussed at Meeting 4, environmental taxes are typically regressive, imposing a heavier tax burden on low-income households than on high-income households, since the former spend a larger share of their overall income on the cost of necessities like heating, electricity and transport.[72] There are also challenges for certain individuals and businesses changing their behaviour due to a lack of alternatives (e.g. fuel for HGV's), or having the means to afford any available alternative options (e.g. EV's or PHEV's).

These issues are at the heart of the "just transition" approach which attempts to recognise that the impact of moving to a carbon neutral and climate resilient society will not be the same for everyone. The Climate Action Plan 2021 also provides for the establishment of a Just Transition Commission recognising that some sectors will be more impacted than others and the need to assist people with the cost of the transition.

[71] "Assess whether the funding model for water services is sufficient to cover the high investment costs and whether household water charges would be an appropriate financing source." OECD, OECD Environmental Performance Reviews, Ireland (2021)

[72] For a comprehensive literature review of this in an international and Irish context, see Section 2.1 of "The economic and distributional impacts of an increased carbon tax with different revenue recycling scheme", ESRI, 2019.

The just transition is understood as primarily encompassing redistributive measures that return a level of income to certain households or sectors who may be adversely impacted by the carbon tax increases on society overall. These measures may be delivered through the tax system, the welfare system or general expenditure.

The 2020 Programme for Government has clear commitments to the just transition alongside the commitments to the European Green Deal[73]. Since 2020, the revenue from future increases to the Carbon Tax has been allocated to expenditure on targeted social welfare measures and other initiatives to prevent fuel poverty and ensure a just transition; a socially progressive national retrofitting programme and funding to encourage and incentivise farmers to farm in a greener and more sustainable way.

As discussed above, the behavioural impact of the carbon tax means it is a potentially unsustainable revenue stream in the longer term as the desired reduction in carbon emissions will result in a decrease in tax revenue over time. This could raise future questions on how sustainable the recurring costs of some of the just transition measures is longer term.

Another question arises as to the extent that future increases to general social welfare payments for the just transition, particularly those available to those of working age, may impact work incentives for recipients. Some relevant just transition measures for consideration are as follows:

3.4.1 Fuel allowance and social welfare measures

Increases to the carbon tax will have a limited impact on households in general; however, the effect is regressive. Additionally, low income households are more likely to live in a home with poorer energy efficiency.

Compensatory measures may be taken to mitigate and reduce the regressive impact of the carbon tax increases. In order to achieve this a targeted package of social protection measures has been introduced, informed by ESRI research[74] and giving effect to a Programme for Government commitment. This package includes an increase to the Qualified Child Payment, the Living Alone Allowance, the Fuel Allowance, and the income threshold for the Working Family Payment

These measures are additional to Budget 2020 and Budget 2021 measures that increased the national fuel allowance, living alone allowance, qualified child payment, as well as allocating additional funding

[73] For more information on the European Green Deal see here. The Fit for 55 legislative package is part of the European Green deal containing more ambitious emissions reductions targets (55% by 2030).
[74] Analysis undertaken using SWITCH, the ESRI tax and benefit model, has indicated the net impact of these combined measures is progressive with households in the bottom four income deciles will see all of the cost of the carbon tax increase offset.

for energy efficient grants. The Household Energy Allowance allowance is provided as part of the household benefits package and includes a contribution to assist with the cost of a person's electricity or gas bill.

When making general increases to working age social welfare payments to offset the impact of the carbon tax increase, care is required to ensure that such changes do not negatively impact on work incentives.

3.4.2 Farm income supports

As per the Programme for Government, €1.5 billion of additional current funding will be made available over 2021 – 2030 for new schemes that will assist farmers to address the climate and environmental challenges in the agricultural sector. The specific use of the funds arising over the period 2023 – 2027 will be detailed in the Government's implementation programme for the new Common Agricultural Policy 2023 – 2027, which will be published later in 2021 and will take effect from 2023 onwards.

3.4.3 Other

Other measures include grant schemes, such as the Better Energy Home Scheme and the Better Energy Warmer Home Scheme, both administered by the SEAI, which provide grants to homeowners to improve the energy efficiency of their homes. This includes grants for measures such as insulation, heat pump systems, heating control upgrades, solar thermal solutions and the Better Energy Warmer Home Scheme is specifically targeted at elderly people and those most vulnerable to fuel poverty.

4. Conclusions and questions

Taking account of the elements discussed in this paper, views of the Commission on the following are invited to inform further work by the secretariat.

- Should the rate of the Irish carbon tax be increased to €100 per tonne of carbon dioxide more quickly?
- Should environmentally harmful tax expenditures and fossil fuel subsidies in the tax code be withdrawn or phased out? How can account be taken of the lack of alternatives in some sectors and other constraints like the Energy Tax Directive?
- What alternative sources of tax revenue do you think should be considered to ensure fiscal sustainability?
- How sustainable is the just transition?

Appendix 1 Carbon Budget

The Climate Action and Low Carbon Development (Amendment) Act 2021 puts in place the legal framework for carbon budgets. The Climate Change Advisory Council has recently recommended the adoption of two carbon budgets, for the periods 2021 – 2025 and 2026 – 2030, along with a provisional carbon budget for 2030 – 2035. These will be brought to Government by the Minister for Environment, Climate and Communications and the Government will then bring these carbon budgets before the Houses of the Oireachtas for approval.

These carbon budgets set out the total amount of greenhouse gases that may be emitted in the State during a 5 year period (measured in tonnes of carbon dioxide equivalent). The 2021 – 2025 carbon budget provides for an average year on year reduction of emissions in the State by just under 5%, and the 2026 – 2030 carbon budget provides for an average year on year reduction of emissions in the State of just over 8%.

When the overall carbon budgets are agreed, the Minister for Environment, Climate and Communications will propose sectoral emissions ceilings providing for a decarbonisation target (within a range) for individual sectors.

Appendix 2 Fit for 55

In their discussions at meeting 4, the Commission members recognised the importance of the role of the European Union in shaping Ireland's environmental and climate policy generally, but particularly in relation to taxation. This appendix is intended to provide a succinct, factual summary of the Commission's recent legislative proposal, the Fit for 55 package.

The key tax policies provided for in the Fit for 55 package to achieve the aims of the European Green deal are the revision of the Energy Tax Directive and a potential Carbon Border Adjustment Mechanism.

On 14 July, the EU Commission published a set of legislative proposals, the 'Fit for 55' package, intended to provide a framework to achieve a reduction of greenhouse gas emissions of at least 55% (below 1990 levels) by 2030. These proposals include:

- Updated Effort Sharing Regulation (ESR) , which includes revised, more emissions reductions targets for EU Member States, including an increased emissions reduction target of 42% by 2030 (relative to 2005, up from 30%) for Ireland;
- The extension of the Emissions Trading System (ETS) to the maritime and aviation sectors;
- A separate ETS for road transport and buildings (by 2026);
- A Social Climate Fund;
- A Carbon Border Adjustment Mechanism;
- More stringent carbon dioxide performance rules for cars and vans;
- An updated Energy Tax Directive;
- A Land Use Land Use Change and Forestry Regulation;
- Energy Efficiency Directive and Renewable Energy Directive; and,
- Promotion of alternative fuels for aviation and maritime.

Effort Sharing Regulation Targets

While the Climate Action Low Carbon Development (Amendment) Act provides for an emissions reduction target of 51% by 2030, this target is for the whole economy; the target under the Effort Sharing Regulation of a 42% emissions reduction only applies to the Effort Sharing Regulation Sectors. Agriculture is included in this and is responsible for 40% of Ireland's emissions in the ESR sector.

The package also includes a proposal to phase out the free allowances for the aviation sector by 2027 and the extension of the ETS to the maritime sector over the period 2023 – 2025. Given Ireland's reliance on both aviation and sea transport as a peripheral island nation with no possibility of alternative transport modes, there are cost and competitiveness implications for Ireland's economy.

Extension of emissions trading system to transport and buildings

This proposal to apply a separate emissions trading system to road transport and buildings will have significant implications for Ireland. Given these sectors are current subject to domestic carbon tax, the inclusion of these sectors in an emissions trading system could impose double taxation on the emissions associated with the energy use of these sectors.

Carbon dioxide performance rules for cars

The requirement for all cars to be zero emissions by 2035 is in line with the Climate Action Plan 2021 and is likely to include legislation banning the sale of fossil fuel cars from 2030 no longer granting NCTs to fossil fuel cars from 2045.

Land Use and Land Use Change and Forestry (LULUCF) Sector Targets

Ireland has been allocated an EU target of a net annual greenhouse gas removal of 3,728 tonnes of carbon dioxide by the LULUCF sector to be achieved by 2030. Ireland was granted the maximum flexibility allowed under the LULUCF regulation.

Renewable Energy Directive and Energy Efficiency Directive

The Renewable Energy Directive effectively doubles the overall binding EU target for the share of renewable energy from to 40% by 2030. Ireland has submitted to the Commission that it can reach a renewable energy target of 34% by 2030; however, achieving this will require significant and unprecedented growth in renewable energy usage. Failure to reach this target would likely involve purchasing compliance and entail significant costs.

The proposal is to make the Energy Efficiency Directive headline target of 33% energy efficiency in final and primary energy consumption binding and increase it to 36 – 39%. This indicates there may be possible compliance costs if this target is not met and Ireland has been deemed to be insufficient in meeting its national energy efficiency targets both for primary and final energy consumption in the latest Commission progress report (2020).

Energy Tax Directive (ETD)

The ETD sets out excise duty rules covering all energy products used for heating and transport, as well as electricity. The main proposed revisions to the ETD included:

- Minimum rates to be based on energy content and environmental performance rather than volume
- Fossil fuel subsidies to be phased out over the period 2023 – 2033.
- The tax base will be broadened to include new fuels such as biofuels and hydrogen

The ETD proposed revision to the minimum rates is not likely to cause significant issues for Ireland as Ireland already taxes above the minimum rates for the majority of fuels covered by the ETD.

The revised Energy Tax directive proposes a gradual removal of the relief from electricity tax for electricity used by households with a change in the minimum rate of taxation for electricity for non-business use from €1 per Mwh to €0.57 in 2023 and €0.67 in 2033. This allows for the gradual continuation until 2033 for households classed as vulnerable and a provision for reduced rates in these cases thereafter.

Carbon Border Adjustment Mechanism (CBAM)

The purpose of the CBAM is to address the risk of carbon leakage through putting a price on third country imports into the EU of certain high-polluting goods based on their carbon content. It will initially apply to imports of cement, iron, steel, aluminium, fertilisers and electricity. This ensures the same carbon price will be paid by domestic and imported products and is in line with WTO rules and other international obligations the EU has.

Free ETS allowances will gradually be phased out from 2026 for CBAM sectors and the CBAM will be based on a system of certificates to cover the embedded emissions. The CBAM is also a potential EU own resource and will therefore contribute to the EU Budget.

Given Ireland's highly globally integrated economy, there is likely to be significant trade and competitive implications of the CBAM proposal.

Appendix 3 Climate Action Plan 2021

In their discussions at meeting 4, the Commission members were cognisant of the forthcoming Climate Action Plan 2021, following on from the 2019 Action plan and were keen to consider the plan when it was published in order to better inform the Commission's further deliberations and discussions.

he Climate Action Plan 2021 was launched on the 4th November 2021.

This appendix aims to provide a brief, factual overview of the main measures outlined and proposed by the Government in the Climate Action Plan.

Along with the measures already provided for in the 2019 Climate Action Plan[75], it provides to a number of additional measures in order to achieve the increased emissions reductions targets of 51% by 2030 and Net Zero by 2050.

The key environmental tax measures currently in place that form part of the Climate Action Plan 2021 include:

- The carbon tax and ring-fencing of carbon tax revenues;
- Tax incentives to promote the uptake of electric vehicles, including VRT relief and BIK exemptions;
- Emissions based VRT and motor tax regime; and,
- The use of accelerated capital allowances to promote business investment in energy efficient equipment and gas-powered commercial vehicles (to be reviewed in advance of their applicable sunset clauses).

These are to be reviewed and reformed annually.

Additionally there is a commitment in the Climate Action Plan 2021 to undertaking an examination of the following tax measures

- Introduction of an emissions-based tax regime for light goods vehicles;
- Gradually phasing out VAT rebates on commercial fuel use where electric alternatives exist;
- The equalisation of excise on diesel and petrol;
- Inclusion of environmental criteria into the vehicle BIK regime; and,
- Assessing the role for taxation measures in meeting the building retrofit targets.

Other key measures and targets:

- Establishment of a Just Transition Commission

[75] The Climate Action Plan 2021 assumes full implementation of the Climate Action Plan 2019.

- Allocation of €9.5 billion in additional carbon tax receipts
- Increase the proportion of renewable energy to up to 80% by 2030 (with an increased target of up to 5 Gigawatts of offshore wind energy)
- Microgeneration scheme for households, small-scale generator scheme for famers, businesses and communities
- Deployment of renewable gases (green hydrogen and bio-methane)
- Attracting businesses to invest in decarbonisation technologies
- Retrofitting 500,000 homes by 2030
- Installation of 680,000 renewable energy sources (heat pumps) in new and existing residential buildings
- Increased targets of up to 2.7TWh of district heating to be supplied
- 500,000 extra walking, cycling and public transport journeys per day
- Increasing the proportion of kilometres driven by passenger electric cars to between 40% and 45% by 2030
- All replacements for bus and commuter rail vehicles to be low or zero carbon by 2030
- Increased rural public transport rollout (Connecting Ireland)
- Reduction in the use of chemical nitrogen and more targeted use of fertilisers
- Improvement of the genetics of the herd
- Incentivise increased organic farming and diversification into forestry, bio methane and energy production by farmers
- Bog rehabilitation, increased afforestation, improved management of grasslands on mineral soils, increasing the use of cover crops in tillage, rewetting of organic soils
- Reduction of food waste by 50%, ensuring all plastic is reusable or recyclable by 2030 and an increased capacity to recycle packaging waste by 70% and plastic package waste by 55%

The Climate Action Plan will be updated annually along with the roadmap of actions. This is also intended to reflect developments in technology and research in relation to climate action.

Appendix 4 International Comparison

Table 7 International Comparison of Economic and Fiscal Environmental Policies

Type of Measure	Countries that have this measure	Sector
Road usage fees (based on distance travelled)	Belgium; Estonia (including on heavy duty vehicles as well as passenger vehicles); Germany; Hungary; Lithuania; Sweden	Transport
Road Toll	Czech Republic (for trucks over a certain weight); Hungary; Lithuania; Germany (for trucks) Slovenia (for freight transport)	Transport
Congestion charge	Estonia; Italy (Milan); UK (London); Stockholm (Sweden)	Transport
Vehicle registration tax	Austria; Croatia; Denmark (based on fuel efficiency) Estonia; Latvia; Luxembourg; Netherlands; Portugal; Sweden	Transport
Annual motor vehicle tax	Denmark (based on fuel efficiency per km); France; Estonia; Latvia; Netherlands; Portugal; Sweden	Transport
Vehicle excise duty	Cyprus	Transport
Heavy vehicle charges	Sweden	Transport
Vehicle fuel tax (including excise and energy taxes)	Cyprus; Latvia; Luxembourg; Sweden; Slovenia	Transport
Tax incentives for environmentally friendly vehicles including electric cars and electric bicycles	Belgium; Finland; Greece; Hungary; Luxembourg; Malta; Portugal; Sweden;	Transport

Tax incentive for company cars (including electric, hybrid and gas powered cars)	Belgium (Benefit-in-Kind regime changed from home-work distance to emissions); France; Luxembourg; Sweden	Transport
Tax incentives for using environmentally friendly forms of transport, including bicycles and public transport	Belgium	Transport
Tax relief on biofuels	Czech Republic; Finland; France; Greece; Sweden; Switzerland	Transport
Rate of excise on and taxation of natural gas	Czech Republic; France; Germany; Greece; Latvia; Luxembourg; Sweden; Switzerland	Transport
Tax on air travel	Sweden	Transport
Rate of excise on fossil fuels used in electricity generation	Belgium	Energy
Removal of tax exemption on coal and heavy fuel	Belgium	Energy
Tax incentives (VAT) for renovation of residential buildings and energy improvement of housing stock as well as new buildings	Belgium; Italy; Latvia; Luxembourg	Energy
Promotion of bio-liquids in the heating of buildings	Finland	Energy
Tax deductions/incentives for investment in energy savings in residential buildings	Belgium; France (reduced VAT rate); Italy; Greece	Energy
Tax deduction for energy savings in buildings	Italy	
Tax deductions/reliefs for energy saving investments by businesses	Belgium; Greece; Italy (aimed at micro, small and medium sized businesses and start-ups); Netherlands	Energy

Tax on noxious air polluting emissions	Latvia; Slovenia	Energy
Ecological tax on energy (electricity and natural gas, fossil fuels)	Cyprus; Germany; Latvia; Netherlands; Sweden	Energy
Tax on consumption of natural gas and biofuel	Denmark	Energy
Electricity consumption tax	Denmark	Energy
Electricity tax	Latvia	
Electricity Tax Subsidies	Denmark (to be phased out by 2022); Finland	Energy
Carbon tax discount for energy intensive industries on the condition of improvement of energy efficiency	Denmark	Energy
Tax relief for micro production of renewable energy (households and businesses)	Sweden	Energy
Solar Power – exemption from grid fees and electricity taxes for those who produce electricity; household tax deduction from solar system installation	Finland	Energy
District heating – environmental pollution tax reliefs	Lithuania	Energy
Reimbursement for tax on diesel for machinery in agriculture, forestry and aquaculture	Sweden	Energy
Climate Change Levy (on supply of energy to business and public sector)	UK	Energy
Tax on HFCs, PFCs and SF6 (hydrofluorocarbons, perfluorocarbons; and sulphur hexafluoride)[76]	Denmark; France; Iceland (F-gases)	Industrial Processes

[76] These are gases used in industrial processes for refrigeration, as cleaning agents, and for insulation.

Waste tax (incineration or landfilling; weight and volume based tax)	Denmark; Finland; France; Iceland; Sweden; UK	Waste
Carbon tax (taxation of fossil fuels and energy products based on carbon dioxide emissions)	Belgium; Denmark; France; Iceland; Latvia; Portugal; Slovenia; Sweden	Cross-cutting
Mineral Oil Tax / excise on road transport and other fuels and electricity	All EU Member States (under the Energy Tax Directive	Cross cutting (Energy; Transport)
Eco-cheques – exemption on income tax and social contribution on cheque provided by employer for the purchase of ecological goods and services	Belgium	Cross-cutting
Tax on energy consumption	Cyprus; Denmark; Netherlands	Cross-cutting

Source: EEA database on climate change mitigation policies and measures in Europe

Appendix 5 Update from COP26

COP26 took place in Glasgow.

The main issues that were agreed on are summarised below for the information of the members of the Commission. These are high level principles and agreement and there were not any tax specific measures included in the Glasgow pact. The agreement warns that current progress is for from what is required to keep emissions to levels where global warming is limited to 1.5 degrees Celsius.[77]

- Emissions reductions and changes to the process of providing nationally determined contributions (national climate plans).[78]
- Phasing down coal.[79]
- Resolving some key issues in respect of Article 6 of the Paris Agreement relating to carbon markets.[80]
- Funding of clean energy and backing for clean technology.
- Commitment to reducing methane emissions by 30% by 2030.
- Commitment to sustainable farming and investing in green agricultural practices and protecting nature.
- Commitment to low/zero emissions transport.[81]
- Halting and reversing deforestation.
- Loss and Damage Facility.[82]

[77] This is in line with the Paris Agreement of limiting global warming to "well below 2 degrees Celsius above pre-industrial levels.

[78] These are only required every five years under the Paris Agreement. Countries will meet next year to pledge further cuts to emissions of carbon dioxide.

[79] The exact wording of the agreement was changed from "phase out" to "phase down" due to pressure from India and China. This is the first time fossil fuels have explicitly been mentioned in a UN Climate Agreement. Countries also committed to stopping fossil fuel subsidies.

[80] Article 6 is the final article of the 2015 Paris Climate Agreement to be implemented. It sets up a carbon crediting mechanism to be used by government to meet their emissions reduction targets under the nationally determined contributions. It sets the UN as a certifier of carbon projects that can generate credits for governments. It also indicates that credits must be adjusted when credits are transferred abroad/traded rather than being used against NDC targets, including to other governments and private actors, which means such credits are only used once.

[81] Stopping the sale of non-electric vehicles and creating green shipping corridors/zero emissions maritime routes.

[82] This is funding to pay for "loss and damage" that is particularly experienced by developing countries, island countries and other climate-vulnerable countries. The creation of a new Loss and Damage facility was vetoed by the EU and US. There was a commitment to double the collective share of adaptation finance by development countries (there is a target of $100 billion annually for 2021 – 2025) and a commitment to a process to agree on long term climate finance post 2025.