

The Climate Action Plan – A review of potential exchequer implications

PBO Publication 38 of 2019

Introduction

On June 17 2019, the Government launched the new Climate Action Plan 2019 (“the Plan”). The Plan represents the first major shift in Ireland’s climate response in almost 20 years, and identifies the major changes, societal and economic, needed in order to address the Climate crisis, with the stated goal to move Ireland towards net zero carbon emissions by 2050.

This note provides an overview of the economic implications of the Climate Action Plan in the context of Ireland’s commitments under EU law and the Paris Agreement¹, the potential impact of climate change on the Irish economy, and the cost of measures announced under the Plan. This note is not an exhaustive summary of the Plan, but rather a snapshot of some of the key measures within the Plan and their related costs, as they relate to the new prioritisation of Climate Action in Government policy.

The Plan details, and expands on, the targets for several measures announced as part of the [National Development Plan \(NDP\)](#) and includes new measures in the area of heating and electricity. Under the NDP, approximately 25% of all new investment will be explicitly related to climate response.

In general, it is difficult to determine the full Exchequer impact of the suite of measures detailed in the Plan, particularly when considered against the cost of potential fines should we fail to reduce emissions, and the cost of environmental degradation as a result of climate change.

1 The Paris Agreement is part of the United Nations Framework Convention on Climate Change. Refer to page 127 of the [Oireachtas Committee on Climate Action Report](#) for an explanation of the UNFCCC and the Paris Agreement

Key messages

- Ireland’s failure to reduce our greenhouse gas emissions will result in hefty fines at EU level, estimated to be €600 million annually from 2021, until targets are reached. Failure to reach 2030 targets may result in fines in excess of €1 billion.²
- The Plan offers a whole of Government response to climate change, with the embedding of climate change policy within departments to be costed as part of the Revised Estimates (REV) process.
- New Carbon Budgets will be introduced across departments to limit and target carbon emission reductions across sectors.
- The tax system is likely to be leveraged extensively in order to incentivise change in consumers and enterprise, including the increase of the carbon tax rate to at least €80 per carbon tonne by 2030, and the equalisation of petrol and diesel VAT.
- Renewable energy targets and electric vehicle (EV) targets have been increased relative to the NDP and are likely to incur new infrastructure costs.
- The estimated cost of climate change response is difficult to predict due to the scale of the challenge and the wider nature of the response. However, of the costs available for detailed schemes, the PBO estimates that between €30-40 billion has been earmarked for climate response and sustainability under the NDP.

Overview

Man-made greenhouse gas emissions produced primarily from the combustion of fossil fuels such as oil, gas, coal and peat and changes in land use and land cover as a result of economic activity and rising populations have contributed to a more than 1°C rise in global temperatures since pre-industrial times. Climate change is negatively linked with the macro economy and economic activity in a number of ways. Climate change causes an increase in severe weather events which leads to business

2 Committee of Public Accounts, 2018. [Periodic Report No.2, November - December 2017](#).

losses and also places increased pressure on public services, such as health and infrastructure. It has further negative implications for productivity of businesses which rely on the environment for production (such as farming). Climate change is already contributing to an increase in flooding, drought, increasing food insecurity, resource pressures, and many other negative effects. Adverse weather events, such as Storm Ophelia and Storm Emma, are estimated to have caused €45 million and €39 million in damage respectively.

Should current emissions continue unabated, it is expected that global temperatures may increase by up to 5°C degrees by 2100. Due to the cross cutting nature of the climate crisis a global response is needed, encompassing an inter-sectoral policy and societal changes to effectively limit rising temperatures and the worst impacts of climate change.

Under European Law, Ireland has committed to achieving a greenhouse gas emission reductions target of at least 20% by 2020 compared to 2005 levels. However, Ireland has failed to sufficiently reduce emissions in this time frame. Furthermore, certain sectors have seen increases in total net emissions. As such, the Department for Communications, Climate Action and Environment estimated that Ireland will spend €66-€103 million a year from 2020 on the purchase of emissions allowances until we meet targets.³ Costs associated with missing later targets (2030) could be substantially higher (€1.7 billion).⁴

Furthermore, Ireland routinely ranks among the worst performing EU countries for Climate Change Policy and Response.⁵

For a detailed overview of Ireland and the international community's engagement on climate change and the EU's Emission Trading System (ETS) see [PBO Briefing Paper 12 of 2018: An Approach to Better Incorporate Climate-related Considerations into the Budget Process](#).

3 Department of Communications, Climate Action and Environment (2019), National Economic Dialogue 2019, Breakout Session 5 "[Delivering On The Ambition Of The Climate Action Plan](#)".

4 The Irish Times (2019), [Ireland to fall short of carbon-cutting targets, even with extra measures – EPA](#).

5 [The Climate Change Performance Index](#), 2019

Cost-Effective Measures

The Plan identifies numerous measures to achieve climate action goals in Ireland. Efforts have been made to identify the most cost-effective methods of reducing Ireland's emissions in line with decarbonisation targets using a Marginal Abatement Cost Curve (MACC), copied below in Figure 1.⁶ This method estimates the total lifetime cost of each measure, and ranks measures on their cost-effectiveness. The most cost-effective measures are those which require relatively small costs to reduce carbon emissions by one unit. Alternatively, the least cost-effective measures are those which require relatively high costs to reduce carbon emissions by one unit.

Methods to reduce emissions include adopting new technologies and fuel switches. The measures found to be the most cost-effective are the measures that are advocated for in the Plan. The majority of these measures are actually found to result in net lifetime cost savings, meaning that in the long run introducing these measures will lead to a decrease in costs compared to if this measure was not introduced. To achieve the desired targets, both measures that result in net lifetime savings and some measures that result in net lifetime costs will need to be adapted.

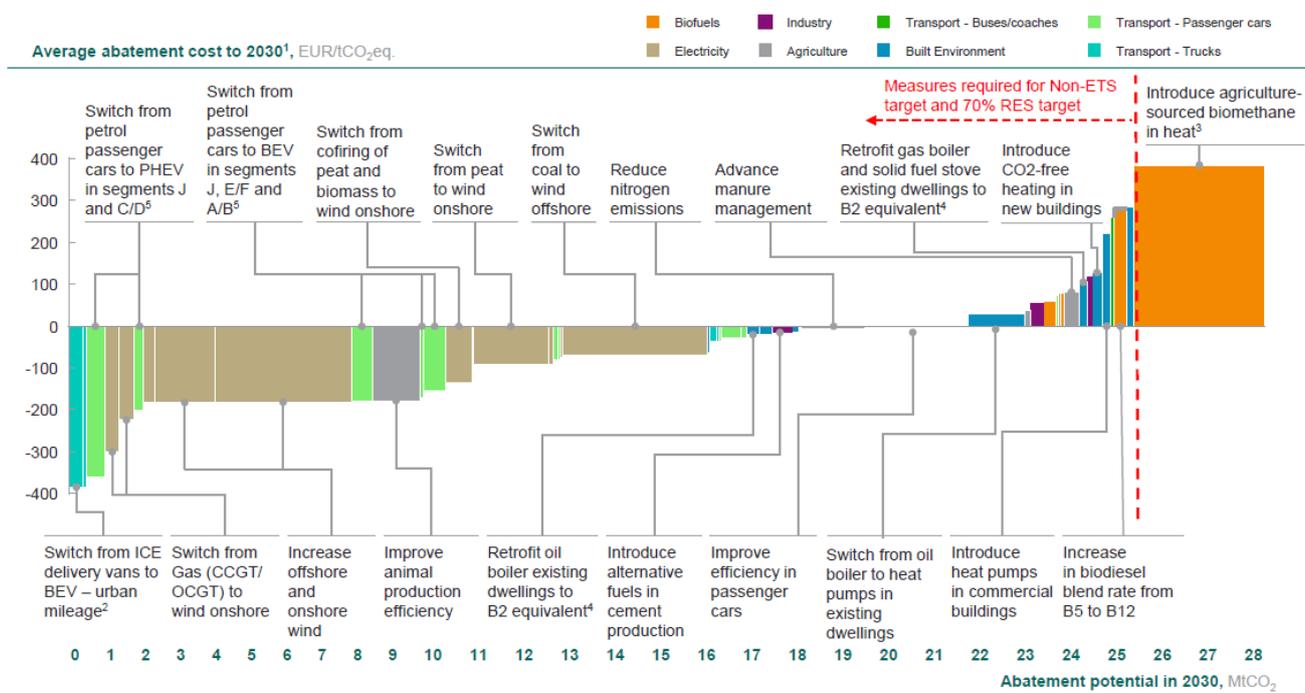
It should be noted however, that the cost of implementing policies and incentivising uptake of these measures, are not considered in the calculation of total lifetime cost. In addition, the cost of enabling infrastructure (which is likely to be considerable) or other barriers to change are not considered when calculating total lifetime cost. Taxes are also excluded from this analysis. The inclusion of these costs could change the result of how cost-effective each measure is.

It should also be noted that the measures that result in net lifetime cost savings will still require upfront costs which could pose a considerable challenge for society to implement. The Plan identifies that the actions needed to achieve climate change goals are large and varied and that it is not feasible for the taxpayer to pay for all the actions required. The Plan states that it is 'essential that the burden's borne are seen to be fair and that every group is seen to be making an appropriate level of effort'.⁷

6 The cost-effectiveness of these methods has been identified through the MACC which was developed by McKinsey and Company on behalf of DCCAE

7 Government of Ireland (2019) [Climate Action Plan](#). P.9

Figure 1: The Marginal Abatement Cost Curve for Carbon Reduction as detailed in the Climate Action Plan 2019



Note: The horizontal axis shows the abatement potential of the technology switches. The vertical axis displays the average abatement cost as EUR/tCO₂ for each switch. The CO₂ price of the EU ETS is included in the cost of measures for industry and power and heat

- 1 Measures considered exclude LULUCF and biofuels use in energy/heat production. MACC does not include cost of enabling infrastructure (e.g., EV charging network, transmission & distribution upgrade). Agriculture measures are based on Teagasc Greenhouse Gas Working Group report “An Analysis of Abatement Potential of Greenhouse Gas Emissions in Irish Agriculture 2021-2030”; Total abatement includes abatement for growth in the analysed sectors;
- 2 The switch to electric light commercial vehicles bring early TCO parity due to low weight vehicles doing long journeys;
- 3 Biogas/biomethane abatement lever could displace emissions in both industry, buildings and power,
- 4 B2 BER insulation equivalent: includes wall, roof & window insulation, excludes boiler upgrade
- 5 Vehicle classes include: A/B - mini, small cars; C/D - medium, large cars; E/F - executive, luxury cars; J - sport utility cars (including off-road vehicles)

Source: *The Climate Action Plan 2019*; pg. 28

Cost Implications

According to the Plan, **€30 billion has been allocated to specific climate change response under the National Development Plan** to facilitate the “Transition to a Low-Carbon and Climate-Resilient Society” (in Exchequer and non-Exchequer spending) or 25% of total planned investment up to 2030. This €30 billion includes the transition to sustainable transport (€8.6 billion under priority 4) and specific climate response measures (€21.8 billion under priority 8). In addition to these measures, €8.8 billion is allocated to sustainable resource management. However, the NDP itself did not undergo a climate impact assessment. A breakdown of a selection of the costs which are most explicitly related to Climate Response or are referred to in the Plan, as detailed over the period 2018-2027 in the NDP, are listed in Table 1.

Some €4 billion is also allocated under the NDP for funds related to climate response. These are the Climate Action Fund (included overleaf at €500 million), Disruptive Technologies and Innovation fund, the Urban Regeneration Fund and the Development Fund.

Noting that the Climate Action Plan advocates a holistic, all of government approach to tackle the climate crisis, it would be anticipated that expenditure across government departments will begin to reflect climate policy. Rather than demand new Exchequer spending, the Plan pertains to integrate climate response into existing spending plans and policy. Regulatory requirements are envisioned to bolster this change, realigning spending requirements to accommodate new Carbon budgets (seen below). According to DCCAE officials, as individual actions and their corresponding policy responses will rest with line departments, the bulk of costings for the Plan will take place on an annual basis as

Table 1: Summary of Climate Related Measures as announced in Project Ireland 2040: The National Development Plan 2018-2027

	Exchequer, €b	Non-Exchequer, €b	Total, €b
4. Sustainable Mobility (Lead Dept: DTTAS)			8.6
<i>Of which: Dart Expansion</i>	2		
<i>Metro Link</i>	3		
<i>BusConnects Programme</i>	2.4		
8. Transition to a Low-Carbon and Climate-Resilient Society (Lead Depts: DCCAE, DTTAS, DAFM, OPW, commercial SOEs)			21.8
<i>Of which: Energy Efficiency – Housing Retrofit</i>	3		
<i>Energy efficiency in public buildings</i>	0.8		
<i>Boiler replacement</i>	0.7		
<i>Support scheme for renewal heat</i>	0.3		
<i>Climate Action Fund</i>		0.5	
<i>Electric Vehicles</i>	0.2		
<i>Food Defences</i>	1		
<i>Energy Investment (renewables, interconnector, etc.)</i>		13.7	
9. Sustainable Management of Water and other Environmental Resources (lead Depts: DHPLG, DCCAE)			
<i>Of which: Irish Water</i>	6.8	1.7	8.8

Source: *Project Ireland 2040: The National Development Plan 2018-2027* pg. 21/22

part of the REV process.⁸ In order to aid the Oireachtas in the scrutiny process, it may be advantageous for departments to highlight policy changes made to existing expenditures or re-allocations to accommodate climate response.

Private sector investment is said to be required to address large portions of the Plan, with the intention being that policy will be designed to incentivise investment. As is acknowledged in the Plan, these policy measures will entail tax changes, including the recalibration of motor tax, and the leveraging of local property tax in some capacity.

Upfront costs are likely to be high for many of the proposals detailed below (including the retrofitting of homes and transition to electric vehicles). While these are likely to be cost saving measures in the long run, the cost burden on individuals in the short run appear likely to be large. Detailed policy implementation plans for each of the measures are said to be forthcoming or under development at departmental level.

8 Response to query during BOC meeting of 18/06/2019

Key Climate Actions

Budget Measures and Governance

A core feature of the Plan is the elevation of climate action in the overarching budgetary framework. The implementation of Carbon Proofing will see all new investments undergo a carbon impact and mitigation assessment.

The adoption of five year Carbon Budgets will establish the total amount of carbon which can be emitted over the five year period, with decarbonisation targets set for each sector within the agreed carbon ceilings (similar to the expenditure ceiling model). As it is intended for the costings of new climate actions and carbon reductions to be mainstreamed across Government and incorporated into the REV process, it is anticipated that these carbon ceilings and new measures will be reflected in the REV documents in some capacity.

Ministers with responsibility for the corresponding sectors will report on progress to the Oireachtas Climate Action Committee and in the event carbon ceilings are

breached, the cost of purchasing carbon credits will be drawn from the relevant departmental vote. It is possible that the Oireachtas Committee with ownership of the corresponding vote may also have an oversight role, though this is not addressed in the Plan.

The plan also states that the government would support the establishment of a Climate Action Office within the Oireachtas (similar to the Parliamentary Budget Office), to provide advice and evidence to the Standing Committee as regards the impact of particular policy decisions on decarbonisation and climate action objectives.

Quarterly progress reports on the Plan will also be required under the Plans governance structures. These measures are intended to be enshrined in law under a new Climate Action (Amendment) Bill.

Carbon Pricing and Taxation

It is intended under the Plan, and as proposed by the [Houses of the Oireachtas Committee on Climate Action](#), to increase the carbon tax to at least €80 per tonne.⁹ The Plan sets out that the increase will be spread over successive budgets. At present Ireland has a broad based carbon tax, which has been in effect since 2010.

The ESRI's working paper on [Carbon taxation in Ireland - Distributional effects of revenue recycling policies](#) shows that an increase in carbon tax to €50 per tonne and €100 respectively would reduce emissions by 3.94% and 10.24%.¹⁰

The [PBO's Publication 35 of 2019: An Overview of Carbon Pricing](#) provides an overview of carbon pricing with a particular focus on Carbon Taxation.

In addition to the increases in carbon tax, an extensive recalibration of existing tax structures to incentivise decarbonisation is proposed throughout the Plan. A non-exhaustive list of tax changes proposed in the document includes:

- Changes to motor tax;
- Emission based tax regimes for large good vehicles;
- Equalisation of excise rates for petrol and diesel;

- The incorporation of an environmental criteria into benefit-in-kind tax expenditures;
- The use of Accelerated Capital Allowance regime to promote energy efficient investments;
- The use of Local Property Tax and Stamp Duty to promote major renovations to buildings;
- Packaging taxes to encourage shifts away from single use and non-recyclable plastics; and
- The increase of levies on landfill and waste disposal.

Electricity

Noting that the electricity sector accounted for 19.3% of Ireland's greenhouse gas emissions in 2017, a significant amount of which is generated by high carbon fuels such as peat and coal. The share of Ireland's electricity which is generated by renewable energy has been increasing over time. However, as electricity demand in Ireland continues to grow in line with increased productivity, this has caused the total reduction in emissions since 2011 to remain relatively static. Furthermore, according to EirGrid, demand for electricity is expected to increase by 50% in the next decade in line with economic forecasts.

The Plan sets a target of reaching 70% of all electricity generated by renewable means by 2030, requiring a 50-55% emissions reduction relative to pre-NDP 2030 projection. As noted under the MACC, a shift to renewable electricity will generate some of the most efficient returns in terms of cost and total emissions reductions, though with the noted caveat that this does not account for the cost of enabling the necessary infrastructure to facilitate this transition. Under the MACC, the average cost saving to achieving the targeted reduction is approximately €130 saved per CO₂ equivalent not emitted (Also shown in as €-130/tCO₂eq).¹¹ This however, does not include the cost of the construction of the new energy infrastructure to facilitate this transition.

Under the National Development Plan, €13.7 billion was explicitly allocated for energy investment over the period of 2018-2027.

9 Report of the Joint Committee on Climate Action, Climate Change: A Cross-Party Consensus for Action, March 2019

10 The Economic and Social Research Institute (2019), Carbon taxation in Ireland: distributional effects of revenue recycling policies.

11 A CO₂ equivalent, abbreviated as CO₂ eq is a metric measure used to compare the emissions from various GHGs on the basis of their global warming potential (GWP), by converting amounts of other gases to the equivalent amount of CO₂ with the same global warming potential

In addition to increasing the share of renewable electricity produced, a microgeneration scheme has been proposed to encourage homeowners to invest in renewable energy themselves, which would also enable households to sell back any excess renewable electricity generated in the home (such as through solar panels or small wind turbines) to the grid. At present, a grant exists which allows households to claim back 30% of the cost of solar panels. A similar model has been introduced in the UK, with home-owners allowed to sell back up to 50% of their electricity generated to the grid at a rate of 5.4p per unit while still reducing energy bills.

Enterprise

Emissions due to enterprise composed approximately 13.4% of Ireland's total emissions in 2017, largely condensed across chemicals, foods processing, beverages and cement production, and tracking closely with economic productivity. Furthermore, emissions from the enterprise sector are forecast to grow 12% by 2030.

The Plan details possible savings and measures for industry to take unilaterally and suggests engagement with key stakeholders but does not go so far as to suggest any new enterprise specific tax measures from Government to incentivise change.

Built Environment

The built environment, including emissions from residential and public buildings, accounted for 12.7% of Ireland's greenhouse gases. Though emissions reductions in this area have continued to decline, Irish homes emit 58% more CO₂eq than their EU counterparts and will require a 40-45% emissions reduction relative to 2030 pre-NDP projections if targets are to be reached.

To enable this, the number of homes estimated to require retrofitting up to a minimum B2 BER rating has increased from 450,000 under the NDP to 500,000 under the Plan. The number of heat pumps to be installed to replace fossil fuel based boilers in residential buildings has increased from 370,000 to 600,000, and the target in commercial buildings has increased from 15,000 to 20,000.

While the Plan mentions efforts to reduce the cost burden of these measures through economies of scale, corresponding increases in funding from the amounts allocated under the NDP are not detailed in the plan. Assuming the €3 billion allocated to the retrofitting of 450,000 private residences under the NDP, it can

be calculated that this amount would increase by a minimum of €333 million to €3.3 billion under the higher 500,000 homes target.¹² A further €800 million was allocated under the NDP to retrofit public buildings. Stricter building codes and energy ratings are also proposed to improve building standards.

Transport

In 2017, Transport accounted for 19.8% of Ireland's greenhouse gases, having increased in the period 2011-2017. Of the transport fleet, some 96.7% were dependent on fossil fuels in 2017. As such, a fundamental shift is necessary in transport infrastructure to enable Ireland to meet its 2030 and 2050 emission targets. This is compatible with the analysis conducted under the MACC, which identified the electrification of transport as the most cost-effective means of reducing emissions.

The Plan proposes bringing 950,000 electric vehicles onto the roads by 2030, to be supported by a nationwide charging network. This shift to EVs will be incentivised by a number of policy measures including a ban on the sale of new diesel and petrol cars effective from 2030, the equalisation of VAT rates across petrol and diesel, carbon pricing, new Benefit-in-Kind incentives for companies, and a car scrappage scheme.

However, due to the current high cost of EVs, additional measures may be needed to address any potential regressive tax burden being placed on low-income earners who otherwise would be unable to afford to make the switch to an EV. While increased production of EVs will help reduce their cost, the 950,000 target has been criticised as unrealistic by car manufacturers who state that the replacement rate for Irish vehicles is too low and the production capacity of manufacturers is not yet able to facilitate such demand.¹³

This shift may also fundamentally alter the revenue base generated from Motor Tax, which currently provides lower rates of tax for hybrid and electric vehicles. A forthcoming PBO note on Motor Tax will address these changes in greater detail.

12 This was calculated by the PBO utilising the amount allocated under the NDP (€3 billion) and the number of homes to be retrofitted. This comes to an average of approximately €6,667 per home retrofitted, significantly lower than the €30,000 per home retrofitted as estimated by the SEAI in order to bring each residence up to an A rating.

13 The Irish Times (2019), [Government's climate plan risks looking like yet more hot air](#)

In addition to changes to private vehicles, the Plan states a corresponding shift in the public transport fleet is in progress alongside the expansion of public transport offerings through new infrastructure projects such as MetroLink. Under the NDP, €8.6 billion in Exchequer spending has been allocated to the Department of Transport for “Sustainable Mobility” from 2018 to 2030.

Agriculture

The Agriculture sector generates a third of Ireland’s total greenhouse gas emissions. Agriculture related emissions fell during the period 2005-2011, but have since risen significantly due to increases in beef and milk production.

The carbon efficiency of Irish agriculture is higher than the EU average.¹⁴ However, due mainly to our significant beef and dairy sectors, which are both carbon intensive industries, Ireland still has substantial greenhouse gas emissions from agriculture.

The management of land use also contributes to carbon emissions, as switching land from one use to another can change an area’s capacity to store carbon. In Ireland, total forest area, which can store large amounts of carbon, has increased in recent years due to policies promoting forestry. However despite this increase, Ireland is below the target rate for afforestation.

The Plan outlines how emissions in the agriculture sector will be reduced by an average abatement of 1.85MtCO₂eq (or 1.85 Metric Tonnes of green house gases) from 2021-2030, or 10-15% reduction relative to per-NDP projections through the adoption of a range of improvements in farming practices such as introducing feed policies to reduce methane emissions and change fertilisers, but does not provide much detail on wider sectoral changes to incentivise decarbonisation. These measures have been identified in a 2018 [Teagasc Report](#) and have been identified as the most cost-effective measures, with an average abatement cost of approximately €57/tCO₂eq.

The Plan also outlines measures to increase afforestation rates and support diversification within agriculture and land use, and improve the management of peatlands through rewetting, but it is not clear whether funds needed for these measures are already incorporated into previously published policies such as the *National Policy*

*Statement on the Bioeconomy*¹⁵ (which does not mention the rewetting process or its associated costs) or whether additional Exchequer funds will be needed for these changes. A cost estimate for these changes is not given in the Plan.

Waste

Waste emissions per capita are lower in Ireland than the EU average, contributing 1.5% of greenhouse gas emissions in 2017. However, Ireland’s material consumption is well above the EU average and continues to increase with economic growth.

A number of measures are proposed in the Plan, including the prospect of an EU wide plastic packaging tax to reduce plastic consumption and the introduction of modulated fees to encourage the use of easy to recycle plastics. It is also discussed that levies on disposable items where sustainable alternatives are available may be introduced to tackle plastic waste. It is proposed that a fund be created to promote more innovation in waste management, but no detail on the amount or source of this funding is discussed.

Conclusion

This note has provided an overview of the measures detailed in the Climate Action Plan which are likely to have fiscal or budgetary implications. Due to the overarching nature of the Plan, which envisions a fundamental reorientation of policy towards climate response, an accurate costing of this Plan is not possible.

Where possible, costs which have been provided under the National Development Plan have been noted and in line with the new or expanded measures detailed in the Plan which explicitly relate to sustainability and climate change are likely to be in excess of €30-40 billion from 2019 to 2030. As the Plan embeds climate policy in the Budgetary and REV process, it is expected that these measures will be reflected and prominent from Budget 2020 onwards.

14 Relative carbon emission performance of the Irish beef and dairy herd to other jurisdictions is highly dependent upon the metrics chosen and whether solely production or product lifecycle is considered.

15 Department of the Taoiseach (2018) [National Policy Statement on the Bioeconomy](#)



Publications

Publication 35 of 2019 [An Overview of Carbon Pricing](#)
04 July 2019

Publication 33 of 2019 [Draft Country Specific
Recommendations 2019](#) 18 June 2019

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Publication Date: 09 July 2019