Tithe an Oireachtais
Houses of the Oireachtas

Tuarascáil ón gComhchoiste um Ghníomhú ar son na hAeráide

An tAthrú Aeráide: Comhdhearcadh Traspháirtí don Ghníomhú

Márta 2019

Report of the Joint Committee on Climate Action

Climate Change: A Cross-Party Consensus for Action

March 2019

Contents

Chairperson's foreword

I believe that this report marks the beginning of a new era for climate policy in Ireland. It is a robust response to the Report of the Citizens' Assembly, and it takes account of the stark warning contained in the recent IPCC Special Report on Global Warming of 1.5°C. Our report shows that we are listening to our citizens, demonstrating that we take climate change extremely seriously, and underlining that we must take strong and ambitious action now to address it.

I would like to commend my colleagues in the Committee across all political groupings for their commitment to this process. I thank them for their patience and time in examining numerous critical climate-related issues since September 2018 when we had our first public session. This has all been to ensure this report could be as robust and ambitious as possible. At a time where there is a lack of collaboration on crucial issues across many Governments, our political parties can be particularly proud at reaching a strong consensus position on many of the tough actions Government must take for Ireland to play its part in fairly addressing climate change globally. This has been no mean feat.

It is up to Government now to use this bold political mandate to develop an all of Government action plan, and to feed into Ireland's National Energy and Climate Plan. The Committee, in turn, has a large body of work to begin to hold the Government and public bodies to account for the delivery of climate actions.

It is my earnest hope that the recommendations in this report are implemented as quickly as possible, particularly around the establishment of a new and comprehensive framework for climate policy in Ireland. It has been a privilege to chair this Committee supporting Ireland to meet its international climate obligations and, ultimately, aiming to become a global leader in climate action.

Hildegarde Naughton, T.D.
Chairperson

Executive Summary

The reports of the UN Intergovernmental Panel on Climate Change (IPCC) leave no room for doubt. The climate is warming. This is the case both globally and here in Ireland.[1] The changes we have seen are undoubtedly down to our emissions of heat trapping greenhouse gases (GHGs). The window of opportunity to avoid ever more severe impacts by reducing GHG emissions is rapidly closing. Climate change is not tomorrow's problem. Decisions taken today will significantly impact the climate and Ireland's exposure to climate change for many generations to come. Furthermore, several studies have highlighted how many recent extreme weather events have already been made considerably more likely due to human-induced climate change. It is imperative that the State takes action now.

All parties of the Oireachtas and the independent Climate Change Advisory Council recognise the State's response to climate change has been insufficient. As noted by the Environmental Protection Agency and the European Commission, the State is falling behind in decarbonising the economy and forging a pathway to sustainable development. Ireland's GHG emissions have not yet fallen below their 1990 levels. Emissions are expected to increase rather than decrease in line with projected economic growth. There are significant challenges before us in decarbonising transport, agriculture, energy and housing.

The 2017 Citizens' Assembly report and recommendations have provided a new impetus in climate policy. The report highlighted a strong desire on the part of citizens for the State to take far more ambitious actions to make Ireland a leader in tackling climate change. During the course of the Committee's deliberations, the IPCC Special Report on Global Warming of 1.5°C (published in 2018) gave the starkest warning yet. It highlighted the need for rapid measures to reduce GHG emissions by about 45% globally by 2030 and to net zero by 2050 in order to prevent further dangerous global warming. The Committee heard evidence from senior members of the report's team of authors in that regard.

Ireland urgently needs to do its fair share in meeting its obligations under the Paris Agreement. However, Ireland is currently set to miss the 2020 emissions reduction targets as agreed with the EU by a substantial margin. It is imperative that the State now make all due efforts to meet its EU 2030 emissions reduction targets. As a relatively wealthy state, Ireland should lead by example by immediately taking actions to reverse our current trajectory of increasing emissions. The State must ensure that emissions rapidly decrease in line with a national target of net zero emissions by 2050, as per the IPCC's recent analysis and recommended in this Report.

This Report is the culmination of a six-month examination by the Committee and contains 42 priority recommendations in the area of climate action. These have been made in response to: i) the Citizens' Assembly; and ii) additional evidence presented to the Committee during its deliberations. During the course of these deliberations it became clear that much work remains to be done. The Committee has thus produced an initial set of ambitious actions to help get Ireland back on course to meeting our climate obligations. This Report should be seen as the beginning of an extensive

[1] Please see further detail on climate change science in Appendix 7.

and sustained series of climate actions that are required for Ireland to meet its commitments and play its part in the global response to climate change.

In developing its recommendations, the Committee was cognisant of the need to urgently implement climate actions without any further delays and to increase the pace of climate action with new and additional climate policies to put Ireland back on track to meeting the 2030 targets. The Committee has produced a set of priority recommendations at the end of each Chapter for immediate action by relevant Departments and public bodies. The Report also proposes 39 ancillary recommendations which are discussed within the chapters and which should also be considered in the short to medium-term.

The Committee recognises that early climate action offers other benefits for citizens as well as reducing emissions. Examples include improved health through better air quality and more active lifestyles and better quality of life through warmer homes and lower energy costs. Developing solutions will also afford opportunities to create a more equal and resilient economy.

It is key that the State immediately undertakes significant actions across all relevant sectors. Many of the recommended measures are enabling actions. These include a comprehensive governance framework for climate policy that will pave the way for more transformational changes in individual sectors. The recommendations will contribute to an all of government plan on climate action that is currently under preparation, as well as the implementation of Ireland's 2017 National Mitigation Plan. This report should also inform the development of Ireland's National Energy and Climate Plan (NECP) that will have to be agreed between Ireland and the European Commission by the end of 2019.

The Committee notes that these recommendations, when considered in isolation, may have marginal emissions reductions potential. However taken together, and implemented holistically across Government, they establish a new climate policy architecture that should bring about significant emissions reductions. Many of the actions will involve choices by individuals and businesses which can be facilitated by specific, substantive and sustained actions by public bodies. The recommendations arising are grouped thematically as follows:

Governance

The Report, in Chapter One, calls for new legislation which will set ambitious climate and renewable electricity targets, and which will require five-year carbon budgets to be devised by a new Climate Action Council (which will supersede the existing Climate Change Advisory Council). Responsibility for climate action should be centrally coordinated by the Department of the Taoiseach which has the necessary authority to drive systemic change across Government. The legislation should also provide for a new Oireachtas Committee that will hold Ministers and public officials, at all levels of Government, directly to account for performance on climate action. The new legislation should provide a much stronger framework for the achievement of climate and energy targets and require all public bodies to make climate action a priority.

Supporting a Just Transition

A central concern of the Committee is to ensure that climate action is fair and vulnerable citizens, workers and communities are protected. A Just Transition means exploring opportunities to green existing jobs, and creating new jobs in areas such as energy retrofitting for buildings, sustainable

forestry and peatland restoration. Chapter Two recommends the establishment of a Just Transition Task Force that will examine and address the needs of those regions and sectors that are most likely to be impacted by climate action. This Chapter also addresses specific measures that now need to be put in place for the Midlands arising from the decision to phase out peat extraction.

Citizen and community engagement

Climate action will only succeed if citizens, communities and businesses find it easy to engage and get information on what they can do to lower their carbon footprint. State bodies and local authorities should appoint trained staff for this purpose, to operate in a one-stop-shop type of arrangement. Better resourcing for community energy projects and Sustainable Energy Communities will also be key tools for community engagement and participation in climate action. Recommendations on citizen and community engagement are addressed in Chapter Three.

Education and Communication

The range of actions to be taken across the economy requires a high level of citizen engagement and empowerment. It is also imperative that we equip today's children with the necessary knowledge and skills to be tomorrow's leaders in undertaking climate action. Public information campaigns and our public service broadcasters have a key role to play in informing the public. Recommendations on education and communication are addressed in Chapter Four.

Opportunities

There are many environmental and social benefits as well as significant economic opportunities in the transition to a low carbon economy. As outlined in Chapter Five, Ireland has a strong track record in R&D investments, and new technologies will be needed to develop solutions in energy production and storage, carbon sequestration and the circular economy which may also present business opportunities. Many of the investments we make today will create economic opportunities in the future and will save money over the longer term, as they will drive down national emissions, develop national capacities in mitigation and adaptation, and bring Ireland back into line with our international climate commitments.

Incentivising Climate Action

Public investment decisions have a major impact on carbon emissions over subsequent decades. The Committee, in Chapter Six, recommends a new approach to pricing public infrastructure projects for climate impacts, using a revised shadow price of carbon, and an assessment of the climate mitigation impact and potential of Project Ireland 2040.

Citizens need to be helped in making the transition to lower carbon lifestyles including through innovative financing options such as low-interest loans. A range of choices should be available to citizens to enable them to make more climate friendly decisions including home retrofits.

The purpose of carbon pricing is to put a cost on GHG emissions so that their social and environmental impact is reflected in the cost of fossil fuels. The Committee recommends increasing the existing carbon tax from €20 to at €80 per tonne by 2030 when supports and protection mechanisms are in place, with the increased revenue being ring-fenced separately from general Exchequer funds by legislation. While the Committee debated this topic at length, it was agreed that insufficient information had been made available to help the Committee choose the best way of hypothecating revenues from the carbon tax increases. Therefore the Committee recommends that there should be a public consultation on whether to

return the revenue to citizens equally as a carbon dividend or to spend it in a targeted manner which addresses fuel poverty and supports climate actions.

Energy

As Ireland phases out fossil fuels, our energy needs will increasingly be met by indigenous and plentiful renewable resources. Chapter Seven outlines the Committee's recommendations for developing this capacity in renewable energies and renewable electricity in particular. Developing offshore wind generation will become a priority and the Committee recommends the urgent delivery of a new regulatory and licencing framework to enable this. In addition, the Chapter recognises that citizens must be able to benefit from onshore renewable energy projects, both through participation in new large-scale developments and through micro-generation.

Agriculture, Forestry and Peatlands

The Committee, in Chapter Eight recognises the urgent need for bottom-up approaches to address rising emissions in agriculture and support the sector to transition to a low emission model. As part of this, farmers should be encouraged to engage in climate mitigation measures, which should be incentivised through the Common Agricultural Policy (CAP). The Committee was mindful, given the importance of agriculture to the rural economy, to propose recommendations which support on-farm measures to reduce emissions and improve the sustainability of farming in Ireland, including agricultural diversification. Measures are proposed to reduce soil carbon emissions and enhance the carbon sequestration potential of land through for example, sustainable forestry practices, maintaining hedgerows and rewetting peatlands.

Built Environment

The Report acknowledges the urgent need to retrofit the majority of the housing stock in the State in order to reduce emissions from heating. The Committee recommends a needs assessment to ascertain what is required to deliver the planned rate of energy retrofitting of 45,000 homes per annum, and to explore increasing this to 75,000 per annum. The Committee, in Chapter Nine recommends that the Sustainable Energy Authority of Ireland gives priority to those houses that currently have a poor energy performance as this can help to address fuel poverty. In addition the Committee proposes to address poor energy ratings in much of the rental sector by phasing in mandatory Building Energy Rating (BER) standards.

Transport

Many of the proposals the Committee makes in the area of transport are not new, and relate to the implementation of existing plans. Chapter Ten highlights the need for new infrastructure for cycling, and new transport strategies for both urban and rural areas that will provide integrated, reliable and affordable public transport choices for everyone. The changes needed, while transformative, will bring Ireland into line with our neighbours in Europe. They will require increased investment in public transport infrastructure in the years ahead. There is also a need to improve the infrastructure to support electric vehicles and to phase out petrol and diesel cars.

Conclusion

The Committee hopes that this Report will mark a new beginning in Irish climate action policy. It is imperative that momentum now be sustained in addressing the challenges and delivering a cohesive response to what is the biggest and most important issue of our time.

Chapter 1: The need for a new national framework

1.1 Introduction

The State has, in the past, committed to binding targets to reduce greenhouse gas (GHG) emissions, starting with the Kyoto Protocol. [2] However, Irelands performance in meeting international obligations has to date been poor. The Committee is concerned that official projections of GHG emissions indicate that the State is still off track to meet its 2020 and 2030 emissions reduction targets under the Kyoto Protocol and EU Directives (for further details refer to Appendix 6, *Background to international and national climate change policy*). Ireland's total national GHG emissions were just over 60 million tonnes of carbon dioxide equivalent (CO_2-eq)[3] in 2017.[4] The Climate Change Performance Index[5] recently ranked Ireland as the worst performing EU Member State, where the State was ranked 49th. The Committee notes the evidence from the Marine and Renewable Energy Ireland centre (MaREI) experts that to be consistent with the Paris Agreement, Ireland's GHG emissions should reduce by 5-10% per year, compared to 4% growth that was witnessed in 2016, in order to achieve net zero GHG emissions by 2030-2050.[6] There is clearly much work to be done.

The IPCC Special Report on Global Warming of 1.5°C (SR1.5) released in October 2018 shows that to keep the global mean temperature rise below 1.5°C requires global GHG emissions reductions from 2010 levels of 45% by 2030 and to be net-zero (full decarbonisation) by 2050.[7,] That report has proved a game changer that calls for action on an economy-wide scale. For Ireland, it means Ireland's emissions should be about 33 million tonnes of carbon dioxide equivalent in 2030 compared to 60 million tonnes in 2017. The Committee is of the strong view that the State must move now and quickly to put the structures and systems in place that will ensure that everyone in the State, in whatever role or capacity, can work together to make Ireland compliant with our international climate change obligations, and then to move to a place where we are a world leader, which is where we should be.

The IPCC SR1.5 states that there is an urgent need to strengthen the capacities for climate action of national, regional and local authorities. Current governance structures are not adequate for the task of changing the direction of our emissions trajectory.

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[2] The Kyoto Protocol was adopted in 1997 and entered into force in 2005

[3] "A carbon dioxide equivalent or CO_2 equivalent, abbreviated as CO_2-eq is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential." Source: Eurostat, n.d. *Glossary carbon dioxide equivalent* [online]. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Carbon_dioxide_equivalent [accessed on 22.03.2019]

[4] http://www.epa.ie/pubs/reports/air/airemissions/ghgemissions2017/Report_GHG%201990-2017%20November%202018_Website.pdf

[5] Germanwatch publishes the Climate Change Performance Index (CCPI) which is an instrument designed to enhance transparency in international climate politics. Further information is available at: https://www.climate-change-performance-index.org/

[6] MaREI, 2018. *Note to Joint Oireachtas Committee on Climate Action* [online]. Available at:https://data.oireachtas.ie/ie/oireachtas/committee/dail/32/joint_committee_on_climate_action/submissions/2018/2018-12-12_submission-marei-centre_en.pdf [accessed on 12.03.2019]

[7] IPCC, 2018. *Global warming of 1.5. Summary for policy makers* [online]. Available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf [accessed on 12.03.2019]

1.2 Citizens' Assembly Recommendation

The Citizens' Assembly recommended as follows:

R1: 97% of Members recommend that to ensure climate change is at the centre of policy-making in Ireland, as a matter of urgency a new or existing independent body should be resourced appropriately, operate in an open and transparent manner, and be given a broad range of new functions and powers in legislation to urgently address climate change.

Such functions and powers should include, but not be limited to:

1. *To examine any legislative proposals, it considers relevant to its functions and to report publicly its views on any implications in relation to climate change; the relevant Minister must respond publicly to the views expressed in a [any] report prior to the progress of the particular legislative proposal;*
2. *To propose national sectoral targets for emissions reductions, to be implemented by the Oireachtas, with regular review and reporting cycles;*
3. *To institute proceedings in any Court for the purpose of obtaining redress of any wrong in respect of any matter concerning climate change.*

Recommendation 1 (R1) of the Citizens' Assembly arises from the fact that Ireland is, in the Climate Change Advisory Councils view, "*completely off course in terms of its commitments to addressing the challenge of climate change*"[8]. The Committee shares this view.

As will be clear from the proposals in this chapter, the Committee accepts that to intensify actions to reduce GHG emissions and counter the climate impacts already occurring, and projected to become more severe with further warming, there is a need for a new governance model, that puts coordinated climate action at the centre of Government policy-making and expenditure, underpinned by a clear statutory framework. This should include an all of government approach to climate action with enhanced accountability of Government and public bodies to the Houses of the Oireachtas.

1.3 Strengthening the statutory basis for setting and enforcing climate targets

There are a number of key decisions that now need to be made to put Ireland on course to meet its 2030 climate commitments and beyond. Between now and 2030 there will be at least three electoral cycles with different Government formations, depending on election outcomes. Climate action demands a consistent and credible policy over extended periods of time, otherwise the State will not deliver on its targets. Once the policy framework is set, and the carbon budgets are adopted, it should not matter what type of Government or what parties from the Oireachtas form the Government, the programme will be broadly the same. To achieve this continuous policy approach, the Committee recommends that new legislation be enacted by the Oireachtas in 2019, providing a new legal framework for tackling climate change. This should include the setting of legally binding GHG emissions targets for mitigation and renewable electricity for 2030 and 2050, reflecting the latest IPCC consensus and the need for Ireland to make immediate progress in meeting existing EU emissions reductions 2030 targets.

[8] CCAC, 2018. *Annual review 2018* [online]. Available at: http://www.climatecouncil.ie/media/CCAC_AnnualReview2018.pdf [accessed on 31.01.2019]

The Committee recommends that Irish climate change policy reflects the latest scientific consensus as represented by the IPCC SR1.5[9] and the need for Ireland to make immediate progress on a least cost basis in meeting existing EU 2030 targets. Therefore the Committee recommends that new climate change legislation be enacted by the Oireachtas in 2019 that will include:

1. A target of net zero economy-wide GHG emissions by 2050;
2. A provision for a 2030 target, consistent with the GHG emissions reduction pathway to 2050 to be set by 2020 by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council;
3. Provision for five-yearly carbon budgets, consistent with the emissions reduction pathway to 2030 and 2050 targets, to be set by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council;
4. A target for the renewable share of electricity generation of 70% by 2030.

The Committee acknowledges that the measures currently in place, together with those recommended in this Report, will not be sufficient to meet the targets outlined here. Considerable further work is needed to ensure that the National Energy and Climate Plan (NECP) due at the end of 2019,[10] is adequate to meet Ireland's obligations under the Paris Agreement in line with our ambition to be a climate leader.

The Committee recommends that the State proactively supports increases in EU 2030 GHG emission reduction targets, as a key element of the EU's compliance with its Paris Agreement obligations.

1.4 A New framework for delivering climate action

Once the overall target is agreed, a new framework will govern the way the State will deliver on its legally binding commitments which will involve the following division of responsibilities:

1. The Government will be responsible for allocating carbon budgets and will retain responsibility for the delivery of national targets and international obligations as the executive authority of the State; An all of government approach, led by the Department of the Taoiseach, will ensure that all sectors deliver on targets as mandated by law.
2. An independent external expert body, the Climate Action Council, will have enhanced powers, functions and resources, and will supersede the existing Climate Change Advisory Council. This body will, amongst other things, devise and recommend five-yearly carbon budgets and monitor the progress of the State in reducing GHG emissions.
3. A Standing Committee on Climate Action of both Houses of the Oireachtas will constitute the main accountability mechanism.

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[9] https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf at C.1. The Committee notes the particular importance of early action on methane and black carbon indicated in C.1.2 which shows that modelled pathways that limit global warming to 1.5°C with no or limited overshoot involve deep reductions in emissions of methane and black carbon (35% or more of both by 2050 relative to 2010).

[10] "National Energy and Climate Plans (NECPs) are the new framework within which EU Member States have to plan, in an integrated manner, their climate and energy objectives, targets, policies and measures to the European Commission." Source: CAN, n.d. *National Energy and Climate Plans* [online]. Available at: http://www.caneurope.org/national-energy-and-climate-plans-necps [accessed on 21.03.2019]. Further information available on the European Commission website at: https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/governance-energy-union/national-energy-climate-plans

1.4.1 The role of Central Government under this framework

Under the new framework, the Government will retain collective responsibility for meeting the State's obligations under international climate and energy agreements and will be accountable to the Oireachtas for the performance of all public bodies on climate action. Under provisions in the new Act relating to five-yearly carbon budgets, the Government will, on receipt of a recommendation from the Climate Action Council, incorporate its five-yearly carbon budget proposal in a draft Statutory Instrument which will then require the formal approval of both Houses of the Oireachtas. A "*comply or explain*" provision in respect of the approach of Government to the recommendation of the Climate Action Council will be provided for in the Act. The Department of the Taoiseach shall be responsible for the allocation of GHG emissions quotas and shall co-ordinate with the Minister for each Department as per the fiscal budget process. It will be for the Government to direct public bodies, informed by the best available research, on the most cost effective and politically acceptable strategies that should be pursued in order to meet targets. The existing transition statements required annually under the *Climate Action and Low Carbon Development Act 2015* should be replaced by a system of accountability of the respective Ministers for their Departments on their portion of the carbon budget. Within each Department or agency, the principal official (Secretary General or the CEO in the case of a public body) will act as the person accountable to the Standing Committee on Climate Action for reporting and accountability purposes.

1.4.2 The role of the Climate Action Council

The current Climate Change Advisory Council will, under these proposals, be superseded by a new Climate Action Council that will have an extended remit with increased resources including an independent budget and staffing appropriate to its new functions and structure as follows:

The functions of the Climate Action Council will include:

1. Developing and proposing five-yearly carbon budgets to Government from 2021-2025, 2026-2030 and 2031-2035;
2. Providing scientifically based advice to the Government;
3. Reporting to the new Standing Committee on Climate Action on the recommendations being made to Government on the overarching figure of a maximum allowance of GHGs emitted for the whole economy on five-yearly carbon budgets; Reporting to the new Standing Committee on Climate Action on the performance of the State at least annually and upon request;
4. Keeping a watching brief on climate science developments and periodically reviewing implications for Irish emissions reduction targets and carbon budgets[11];
5. Facilitating collaboration between State agencies, local business, local authorities, third level colleges and civil society in innovating climate solutions; and
6. Working with similar national bodies in other countries to share best practices and jointly commission and analyse work on common challenges to maximise efficiencies.

[11] This is in line with the UK CCC which monitors climate science developments and periodically reviews implications for their emissions targets and Carbon Budgets as per their Fifth Carbon Budget (2015). Available at: https://www.theccc.org.uk/wp-content/uploads/2015/11/Fifth-Carbon-Budget_Ch2_Overview-of-climate-science-and-international-circumstances.pdf [accessed on 26.02.2019] Page 37

The Structure of the enhanced Climate Action Council will:

1. Be broadly modelled on the UK Climate Change Committee, in that it will operate independently of Government with its own funding (three year funding from the Central Fund);
2. Be provided with additional technical and scientific resources to assist in the modelling, assessment and communication of public policy options; and
3. Have access to the expertise and data contained in Government Departments and agencies.

The Committee expects i) that the transition from the Climate Change Advisory Council to the Climate Action Council will continue the momentum to date on climate action, and ii) that the Climate Action Council be reconstituted from the existing Climate Change Advisory Council in 2019 and be in a position to bring forward the first five-year carbon budget in 2020. In that regard, the augmented Climate Action Council will devise and propose carbon budgets, starting with the first one for 2021-2025 by Q1 2020 and the carbon budgets for 2026-2030 and 2031-2035 as soon as possible thereafter.

This approach reflects what is done in the UK, where the Climate Change Committee devises and proposes three carbon budgets in advance. The timeframe will require the Climate Action Council to begin work on carbon budgeting before legislative changes enhance its powers.

The Government will require the approval of the Houses of the Oireachtas for its five-yearly carbon budgets where any divergence between the budgets being proposed and the recommendations of the Climate Action Council will have to be fully explained and justified. Finally, the Minister for Communications, Climate Action and Environment, in consultation with the Standing Committee on Climate Action, shall ensure that the Climate Action Council membership includes a mix of scientific expertise, and a gender balance.

1.4.3 Role of a new Joint Oireachtas (Standing) Committee

While the terms of reference of this Joint Committee will now form part of the Standing Orders of Dáil Éireann and Seanad Éireann respectively, the Committee also proposes that the role and functions of this new Standing Committee on Climate Action of both Houses of the Oireachtas (i.e. a Joint Committee) should be incorporated into the new legislation. The Committee accepts that there is a need for a much stronger role to be played by the Houses of the Oireachtas in holding the Government and all public bodies to account for the delivery of climate action on a sustained basis. The proposal is that this new Standing Committee on Climate Action would have powers similar to the Committee of Public Accounts (PAC). As a Standing Committee, it would fall to be automatically established after each General Election and will have the authority to continue the work of the Committee of the previous Dáil and Seanad. In particular the Standing Committee on Climate Action will:

1. Examine and call to account all Ministers and public bodies[12] on climate action performance on a regular basis;
2. Review in general all aspects of climate change policy, including mitigation, adaptation, international developments and best practice;

[12] Public bodies will include all bodies that are audited by the C&AG and all bodies in Schedule 2 of the Comptroller and Auditor General (Amendment) Act 1993

3. Examine new developments with a view to ensuring that there is a consistent and science based understanding across Government of what climate action entails and that this understanding reflects the latest scientific consensus as represented by the IPCC;
4. Examine the climate implications of any Bill of its choosing and report to both Houses on any significant climate implications of the proposed legislation prior to consideration of the Bill at Committee stage; and
5. Report to both Houses of the Oireachtas on an annual basis and require the Government to formally respond to each report of the Committee within 90 days of the publication of the Report.

1.4.4 Role of all public bodies under this framework

The Committee expects all public bodies to develop a climate change compliance statement addressing both mitigation and adaptation strategies. While certain Departments have a sectoral policy role, it is important that public bodies do not operate in silos when it comes to climate action. Every public body, be they located in central, regional or local government, has a role in addressing climate action. The new legislation will require, in particular, that all relevant policies and measures be subject to a climate change impact assessment and that the actions of public bodies be consistent with:

b) the most recent approved National Mitigation Plan;
c) the most recent approved National Adaptation Framework and approved Sectoral Adaptation Plans;
d) the furtherance of the National Transition Objective; and
e) the objective of mitigating GHG emissions and adapting to the effects of climate change upon the State.

The Committee would like to see networks established so that the knowledge gained from good outcomes is shared and that bodies are open to suggestions from staff on climate actions. The Committee expects that the executive board meetings of all public bodies should have climate action as a standing item on their agendas.

1.5 A Climate Action Implementation Board

The Committee is of the view that, in an approach similar to the one that delivered the *Action Plan for Jobs*, the Department of the Taoiseach will have the central coordinating role and that each Department should report directly to it on progress in the implementation of action plans appropriate to its sector. The Committee welcomes the recent proposals from the Minister for Communications, Climate Action and Environment to establish such a structure.

The Committee proposes, as part of this new approach, that a Climate Action Implementation Board be established in the Department of the Taoiseach which would be co-chaired by the Secretary General of the Department of the Taoiseach and the Secretary General of the Department of Communications, Climate Action and Environment. The primary aim of the Board will be the implementation of the new National Energy and Climate Plan (NECP). This board should also involve the secretariat of the National Economic and Social Council (NESC), and should be given appropriate resources to provide an adequate secretariat to support its work. The Board should report directly to a Sub-Committee of the Cabinet.

1.6 Resourcing of the transition

The Committee has noted the difficulties some Departments or divisions have experienced dealing with the large-scale challenges of transition in their sectors, due to a simple lack of staff capacity and the resulting risk of focusing on a small number of simple responses. The regulatory and policy changes needed to meet our emissions reduction targets are substantial and require systemic engagement. In addition to significantly increasing resources for delivery bodies such as local energy agencies, the Government needs to ensure that sufficient resources are allocated to the work of making regulatory and policy changes. This should take account of the principle of a Just Transition (Chapter 2), considering all of the environmental, social and economic impacts of the changes, and listening to the voices of all sectors of society.

1.7 Priority recommendations of the Committee

The Committee recommends that a new governance framework be established for delivering on climate action, and in that regard it recommends that:

1. New climate change legislation be enacted by the Oireachtas in 2019 that will include, with regard to a new governance structure:
    a) That action on climate should be considered a priority activity across all of Government;
    b) The establishment of a new Climate Action Council to supersede the Climate Change Advisory Council;
    c) The establishment of a Standing Committee of both the Houses of the Oireachtas on Climate Action;

    And with regard to mitigation targets and performance:
    d) A target of net zero economy-wide emissions by 2050;
    e) A provision for a 2030 emissions target, consistent with the emissions reduction pathway to the 2050 target, to be set by 2020 by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council;
    f) Provision for five-yearly carbon budgets[13], consistent with the emissions reduction pathway to 2030 and 2050 targets, to be set by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council;
    g) A target for the renewable share of electricity generation of at least 70% by 2030; and
    h) Strengthening the statutory obligation on public bodies to require that they perform their functions in a manner consistent with the 2050 target and interim targets. (Sections 1.3 and 1.4)

2. A stronger mandate, expanded secretariat and budget be should be given to the Climate Action Council. [14] That mandate shall include the responsibility for developing and proposing five-yearly carbon budgets. The legislation should ensure:
    a. that the board of the Council has a mix and balance of both gender and expertise; and
    b. the Council be given access to the data and expertise held by Government Departments. (Section 1.4.2)

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[13] Carbon budgets will set a ceiling of emissions in millions of tonnes of Carbon dioxide equivalent (CO_2-eq)

[14] The Climate Action Council should continue momentum to date by on climate action so as to benefit from work to date by that body.

3. The Standing Committee of both Houses of the Oireachtas on Climate Action should:
    a. hold Ministers and public bodies to account for their climate action performance;
    b. examine selected public policy proposals for climate implications; and
    c. Report annually to both Houses of the Oireachtas on the performance of the State in meeting its obligations (Section 1.4.3)

4. A coherent all of government approach, supported by the Climate Action Implementation Board, should be adopted for the delivery and management of climate actions. The central coordination and performance oversight role should be mandated to the Department of the Taoiseach (Section 1.5).

Chapter 2: Supporting a Just Transition

2.1 Introduction

A *Just Transition* can drive environmental sustainability as well as decent work, social inclusion and poverty eradication when societies are shifting from a carbon-intensive to a low-carbon and circular economy. Transitioning to a decarbonised society in Ireland must happen in a manner that is just and fair to all sectors of society. The State's national mitigation plans must include Just Transition measures with decent work and quality jobs as a central objective. The International Labour Organisation (ILO) defines a Just Transition more specifically in terms of social, environmental and economic justice:

> *Transitions to environmentally and socially sustainable economies can become a strong driver of job creation, job upgrading, social justice and poverty eradication. Greening all enterprises and jobs by introducing more energy and resource efficient practices, avoiding pollution and managing natural resources sustainably leads to innovation, enhances resilience and generates savings which drive new investment and employment. (ILO, 2015)*[15]

With a Just Transition, climate policies can provide both security and opportunity to citizens, employees and employers alike. A Just Transition model means new jobs, new industries, new skills, new investment opportunities and a chance to create a more equal and resilient economy. The Just Transition is part of an overall climate justice[16] approach. Action on climate change cannot be considered independently of other Sustainable Development Goals, as recognised in the recent IPCC SR 1.5.

While all sectors face challenges transitioning to a low carbon economy, immediate response interventions must be put in place in those locations and for those sectors imminently under threat, such as those whose livelihoods are dependent on Bord na Móna peat extraction activities. While this chapter recommends the establishment of a Just Transition Task Force to address national needs, it also takes as a pilot project the Midlands Region which will be specifically impacted by the cessation of peat extraction. The Committee is conscious that other parts of the country could also be identified as areas for future schemes, especially as work on a Just Transition is most effective when it is planned well in advance of the change occurring. The problem for the Midlands is that the process has started and the State will have to play catch-up in order to address the changes already well underway.

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[15] International Labour Organisation (ILO), 2015. *Guidelines for a just transition towards environmentally sustainable economies and societies for all* [online]. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_432859.pdf [accessed on 21.03.2019]

[16] The Glossary of the recent IPCC SR 1.5 highlights this thus: *Climate justice: "Justice that links development and human rights to achieve a human-centred approach to addressing climate change, safeguarding the rights of the most vulnerable people and sharing the burdens and benefits of climate change and its impacts equitably and fairly."* This definition builds upon the one used by the Mary Robinson Foundation – MRFCJ, 2018: *Principles of Climate Justice.* Available at: http://www.mrfcj.org/principles-of-climate-justice.

2.2 Recommendations of the Citizens' Assembly

While the Citizens' Assembly recommendations do not explicitly mention climate justice or a Just Transition, the aims of such are alluded to in Recommendations 3 and 7 and in Ancillary Recommendation 3 as follows:

R3: 80% of the Members said they would be willing to pay higher taxes on carbon intensive activities subject to the following qualifications:

1. *Any increase in revenue would be only spent on measures that directly aid the transition to a low carbon and climate resilient Ireland: including, for example, making solar panels more cheaply and easily available, retrofitting homes and businesses, flood defences, developing infrastructure for electric vehicles.*
2. *An increase in the taxation does not have to be paid by the poorest households (the 400,000 households currently in receipt of fuel allowance).*
3. *It is envisaged that these taxes build year-on-year.*

R7: 97% of the Members recommended that the State should end all subsidies for peat extraction and instead spend that money on peat bog restoration and making proper provision for the protection of the rights of the workers impacted with the majority 61% recommending that the State should end all subsidies on a phased basis over 5 years.

AR3: The agriculture sector in Ireland requires ongoing support to make a transition towards models of production which give rise to lower GHG emissions. Cognisance must be taken of the impact which the sector has on the economy, particularly the rural economy.

R3 is addressed in Chapter 6, *Incentivising Climate, Action*. R7 is further addressed in Chapter 7, *Energy* and AR3 is dealt with in Chapter 8, *Agriculture, Forestry and Peatlands.*

2.3 Making changes that are fair

In order to achieve a Just Transition, instruments, policies and regulations implemented by the State should alleviate rather than exacerbate inequalities and protect the most vulnerable. We must ensure that climate policies are not unfair to low income workers and households. In all remaining Chapters of this Report, the Committee relies upon the concepts of climate justice and a Just Transition to inform its thinking. These principles have been foremost in the thinking of the Committee throughout its deliberations on these recommendations. The main examples of this are:

- In Chapter 3, *Citizen and Community Engagement* the need for support for community groups to drive the change at the local level is recognised;
- In Chapter 6, *Incentivising Climate Action* while noting that all segments of society need help in making the transition, a distinction is made between those who are in fuel poverty who will need to be aided by grants and those who earn more, for whom a mix of partial grants and State backed loans may be more appropriate. Considerable effort is also made to think about how hypothecation could be applied to carbon pricing to support those most in need;
- In Chapter 8, *Agriculture, Forestry and Peatlands* significant thought is given to tailoring the new CAP payment schemes to support marginal farmers while still meeting our GHG emissions targets; and
- In Chapter 10, *Transport* access to transport options in rural areas is reviewed in some detail.

A Just Transition will not be achieved by a single quick fix. Rather, it requires consideration of the social justice implications of policies and decisions across all sectors.

2.4 Proactive engagement via a Just Transition Task Force

The Committee's view is that the role of the State in a Just Transition should be proactive. Many of the necessary transformations which will need intervention can be anticipated well in advance such as the significant local impacts on those whose livelihoods are dependent on the Moneypoint coal-fired power plant (Moneypoint and the phase out of coal is further discussed in Chapter 7, *Energy*).

To begin the process of a Just Transition in Ireland, we need a social dialogue between workers and their unions, employers, communities, farmers, Government, NGOs and civil society groups. In this regard, the Committee recommends that a National Just Transition Task Force be established to plan the detail of delivering security and opportunity for workers as Ireland embarks on a rapid transition to a low carbon society. While the key task of the Just Transition Task Force is to proactively consider the likely upcoming challenges of the transition in a participative manner, the Task Force shall include a specialist mediation service for workers, communities, and businesses and should make recommendations to Government for action. The Task Force will have an independent Steering Committee and Chair and should be structured to allow it to make optimal use of existing structures and draw on expertise and enable investment to be effectively targeted to where it is most needed. It should also exploit the opportunities that will arise on foot of technological and environmental developments.

The Just Transition Task Force should commission research on which sectors of the economy and regions are most likely to experience serious disruption over the next decade during the transition to a low carbon economy. Now is the time to start engaging with communities and developing new employment opportunities and re-skilling workers to enable a smooth transition with broad community buy-in and local benefits. Communities should not be left on their own to manage the impacts of the transition as this will not lead to a fair distribution of costs and benefits.

As a part of this, the Government should develop regional and sectoral responses. These should plan the detail of delivering security and opportunities for workers and communities impacted and protect, prepare and compensate the workers adequately while assisting the enterprises affected.

2.5 Delivering a Just Transition in the Midlands

While all regions and sectors face significant trials during the transition to a low carbon economy, arguably the Midlands region faces the most pressing needs. The Midlands region is already suffering from recent changes associated with a reduction of commercial peat extraction activities. There are approximately 4,000 additional households in the Midlands that could potentially be impacted, either directly or indirectly, by the phasing out of peat extraction in the coming years. While Bord na Móna has plans for a number of creative enterprises, the Committee is concerned that these do not have the potential to replace the work that was associated with peat extraction. The Committee notes the climate and environmental impacts of peat harvesting for power generation are not improved by the import of unsustainably sourced biomass which will be needed to keep the three Midlands power plants operating (Chapter 7, *Energy*). However, there are opportunities for deep retrofitting schemes for some of the older housing stock in the region.

Similarly the dispersed population could benefit from new rural transport and shared mobility schemes (Chapter 10, *Transport*). While much of the local employment is in the agricultural sector, this points to the need for integrated and targeted policy solutions focusing on incentivising and grant-aiding alternative low-emission land-use activities (Chapter 8, *Agriculture, forestry and peatlands*)

2.5.1 Potential funding mechanisms available at the EU level

The challenge facing the Midlands is not a unique one. Many coal mining regions in Europe are facing similar hurdles. The specific challenge faced by areas reliant on fossil fuel employment has been recognised by the European Parliament which has put forward a number of proposals to establish an EU-wide Just Transition fund. There is a process at EU level to establish a Modernisation Fund. If Ireland is eligible for this funding the State should apply for it.[17]

The availability of EU funding would be of enormous benefit from a climate action viewpoint as it would facilitate a specific focus in order to address the potential of the Midlands, not just in terms of retraining the existing Bord na Móna workforce (as alluded to in the Citizens' Assembly recommendation) and to provide opportunities for the those generations who will no longer have Bord na Móna as a local employment outlet, but also to look at how best to develop the economic and social fabric of the Midlands.

2.5.2 Re-skilling and re-employment potential

A project, that falls outside the current remit of Bord na Móna, but should be explored by the Sustainable Energy Authority of Ireland (SEAI), relates to the delivery of a major house retrofit programme (Chapter 9, *Built Environment*). In this regard, the Committee is of the view that there is significant employment potential for such a scheme, and it also presents an opportunity to re-skill workers in Bord na Móna who are likely to be made redundant to avail of emerging opportunities.

The Committee also recommends that the newly created Regional Steering Committee focus specifically on the employment potential, direct and indirect, arising from the rewetting of the bogs in the Midlands (Chapter 8, *Agriculture, Forestry and Peatlands*). The Regional Enterprise Plans are an evolution of the previous Regional Action Plan for Jobs, a live agenda for policy initiatives to be translated into regional impact in areas such as climate action. Presently peat extraction and combustion contributes significantly to our national emissions and peat bogs left denuded and drained continue to act as a net carbon source long after harvesting has ceased, unless they are actively rewetted. Actively rewetting bogs yields large carbon sequestration opportunities and can offer direct and indirect employment opportunities, both of which need to be assessed. Rewetting bogs requires active management intervention, bringing substantive local employment opportunities. The benefits, challenges and targets associated with the rewetting of peatlands are further addressed in Chapter 8, *Agriculture, Forestry and Peatlands.*

[17] Other EU funding opportunities are outlined in the 3EG November 2018 report *Funding the Just Transition to a Net Zero Economy in Europe: Opportunities in the Next EU Budget.*

2.6 Priority recommendations of the Committee

The Committee recommends:

1. A Just Transition Task Force be established in 2019 to proactively consider the likely upcoming challenges of the forthcoming rapid transition to a low carbon economy. The Task Force should have an independent Steering Committee and Chair and will involve workers and their unions, employers, communities, farmers, Government and civil society to plan the detail of delivering security and opportunity for workers.[18] The Task Force should be invested with the requisite authority and resources, including a specialist mediation service and the facility to draw on expertise as needed. The Task Force shall:
   - commission research in 2019 examining which regions and sectors of the economy are most likely to experience serious disruption over the next decade as part of the transition to a low carbon economy;
   - Address the need for sound investments in low emission and job-rich sectors and technologies by.

     (i) Carrying out early assessments of the social and employment impacts of climate policies;
     (ii) Addressing training and skills development;
     (iii) Identifying social protection needs in the changing industries, along with active labour market policies; and
     (iv) Developing local economic diversification plans that support decent work and provide community stability in the transition.

   The implementation of agreed interventions for transition, as developed in the framework, should involve a partnership approach involving Government, employers, farmers, trade unions and civil society (Section 2.4).

2. With regards to the immediate need to address the ongoing transition in the Midlands region, the Government should direct as soon as possible in 2019:
   a. The Midlands Regional Enterprise Plan (REP) Committee to devise a Midlands Just Transition Strategy, in order to sustain the economic and social fabric of the region in a post peat extraction era. The strategy should make provision for specific funding to finance, amongst other things, a major project to rewet denuded peatlands in the Midlands. This should start with the peatlands owned by Bord na Móna;
   b. Bord na Móna to undertake a review of the employment potential of deploying its current workforce into a peatlands restoration project for its landholding. This review should also outline the full cost of such a project and contain an assessment of the carbon impact of creating a carbon sink; and
   c. The SEAI to examine how best to deliver a major house retrofitting programme in the Midlands (Section 2.5)

[18] This should be based on the ILO *Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All.*(ILO, 2015)

Chapter 3: Citizen and Community Engagement

3.1 Introduction

Climate action will require extensive changes to the way Irish people live and go about their daily business. While costly in the short term, many of these changes will have a longer term economic payback. There will be a need to incentivise the take up of actions that lower carbon footprints via policy and financial instruments available from the State. Meeting those costs is dealt with in Chapter 6, *Incentivising Climate Action*. Many of the required actions have substantial potential co-benefits such as improved air quality, which will positively impact health and well-being, or reduced journey times for individuals freeing up time for other activities. The recommendations of the Citizens' Assembly indicate that there is a strong desire on behalf of individuals and community groups to engage in climate action. It is important that citizens can contribute to the transition ahead, or the scale of transition necessary will not be realised. The task of the State should be to ensure that engagement is made as simple, and as straightforward as possible. During the Committee examinations, the issues raised included the need to address barriers to community participation, and specifically resistance to wind farms.

This Committee believes we need a new focus on State leadership and group behaviour, using hope, optimism and proactivity as drivers for action. Models such as the Transition Town Movement and the Sustainable Energy Communities should be used to encourage uptake and innovation by local groups. These approaches work because they are bottom-up, community centred, and deliver practical solutions for a low-carbon economy.

3.2 Recommendations of the Citizens' Assembly

The Citizens' Assembly made two specific voted recommendations and one ancillary recommendation that directly pertain to the engagement of citizens in the transition to a low-Carbon economy as follows:

R5: 99% of the Members recommended that the State should enable, through legislation, the selling back into the grid of electricity from micro-generation by private citizens (for example energy from solar panels or wind turbines on people's homes or land) at a price which is at least equivalent to the wholesale price.

R6: 100% of the Members recommended that the State should act to ensure the greatest possible levels of community ownership in all future renewable energy projects by encouraging communities to develop their own projects and by requiring that developer-led projects make share offers to communities to encourage greater local involvement and ownership.

AR1: Greater emphasis should be placed on providing positive information to the public which encourages people to make changes to the aspects of their behaviour which impact on climate change. Such information should be targeted at all age groups using a wide variety of formats. The information provided should be focussed on highlighting the economic, social, health and other benefits of taking action rather than focussing on the negatives associated with a failure to act.

Ancillary recommendation 1 is also addressed in Chapter 4, *Education and Communication* and recommendations 5 and 6 are the subject of Chapter 7, *Energy* of this Report.

3.3 The role of local authorities in facilitating engagement with individuals and households

There is an urgent need to prevent households and small businesses from getting locked into high carbon technologies and practices, and to support them in reducing their carbon footprint. In addition, community groups and individuals should be able to communicate local needs and innovations so that engagement is open and flexible and not just top down. The information should be readily available with the likely costs and benefits clearly laid out.

Climate actions can be complex and confusing, so it needs ongoing, expert support at local level and all citizens, communities and small and medium-sized enterprises (SMEs) should have access to local expert advice for both the identification and implementation of relevant energy efficiency and renewable energy actions. For example, a personalised Local Energy Agency service, such as that supplied by Tipperary Energy Agency, or (in another context at a much larger scale) by the Money Advice Budgetary Service (MABS) should be provided in relation to climate action. Local energy agencies and community energy groups such as the Sustainable Energy Communities (SECs) (discussed further in Chapter 7, *Energy*) can provide accessible advice and support for homeowners, business and communities, and can also act as trusted intermediaries. As well as this, they can facilitate community based approaches to deep energy retrofits, energy generation and transport solutions.

The Committee proposes that the Department of Communications, Climate Action and Environment and the SEAI engage with local authorities and the recently established Climate Action Regional Offices (CAROs) to enable them to take the lead in promoting citizen and community engagement on climate action in each county.

Local authorities have significant structures and experience in engaging citizens through their planning functions, particularly local area planning and as facilitators of the Public Participation Networks (PPNs). They can also effectively contribute to climate action in the fulfilment of their existing statutory functions. Climate change considerations should be addressed across all local authority plans, policies and activities including through their existing Strategic Policy Committees (SPCs) and a dedicated new Climate Change SPC for climate action. Each local authority should have a one-stop-shop or other suitable structure for the provision of the necessary information. There will be opportunities to develop structures based on shared learning from councils that are already engaged in climate action, as was seen by the Committee with Tipperary County Council.

3.4 The role of Government in facilitating and supporting citizen and community engagement

Each of the main Departments will be required to produce a detailed outreach strategy as part of an overall whole of government campaign (Chapter 4, *Education and Communication*) addressing the need to act on climate change as well as information on low carbon choices (retrofitting etc.) and the associated benefits such as improved air quality (Chapter 5, *Unlocking potential*). The all

of government approach should coordinate such communications activities across Government at national, regional and local level, to share experiences of the methods and approaches that work best and to enable appropriate professional development for such communicators. This could be actioned through the CAROs.

Government must continue its support of Local Community Development Committees (LCDCs) and PPNs, financed through the Department of Rural and Community Development, as both offer the potential to act as key drivers of effective local action. However, there is currently no specific mandate for these bodies to address climate change. The Committee recommends that the PPNs and LCDCs be fully utilized and supported with additional resources to address climate change as part of their remit and to build capacity among communities to carry out projects which directly tackle climate change starting in Budget 2020. The Climate Action Fund (discussed in further detail in Chapter 6, *Incentivising Climate Action*) is another way of supporting community groups to encourage innovation at local level.

Community participation is also embedded in the latest Renewable Electricity Support Scheme (RESS) which will provide support for renewable electricity projects in Ireland. This is discussed further in Chapter 7, *Energy*.

3.5 Enabling community engagement through stakeholder engagement in Sustainable Energy Communities

The Committee is of the view that strong communities are essential to effect change from the ground up and make the transition to a low carbon society. Top down policies alone won't achieve this. The 'National Dialogue on Climate Action' has been working towards a system of community engagement to build public support for climate action. It should be further supported with additional resources to expand on its existing strategy of citizen engagement in climate action. The most obvious current means for community engagement is via Sustainable Energy Communities (SECs) and it is these that are discussed further in Section 7.5.4 of this report as an example of such engagement where immediate progress can be made. However, community engagement can also be achieved through a wide range of avenues. The Committee heard only limited evidence on community engagement and recognises that the Standing Committee on Climate Action should consider this topic more broadly as a matter of priority.

3.6 Priority recommendations of the Committee

The Committee recommends:

1. The Department of Communications, Climate Action and Environment should enable each local authority to establish or designate a Climate Change Strategic Policy Committee (SPC), to be incorporated into the SPC schemes for each local authority after June 2019. External representation on this SPC should be inclusive of all social, economic and environmental stakeholder groups. (Section 3.3)
2. The Department of Communications, Climate Action and Environment should enable each local authority, individually or jointly, to establish a one-stop-shop or other suitable

structure, with appropriate resources and expertise.[19] This should provide practical advice to households and businesses on significantly reducing GHG emissions and utilise information and advice from the SEAI and the Climate Action Regional Offices. This one-stop-shop must include a strategy for reaching out to all communities by the end of 2020 (Section 3.3).

[19] Refer to the Tipperary Energy Agency as a good model of a one-stop-shop type structure

Chapter 4: Education and Communication

4.1 Introduction

In Chapters 2, *Just Transition* and 3, *Citizen and community engagement,* this Report examines ways to foster citizen and community engagement in climate action. There is also a need to further engage and involve the public to allow a deeper conversation about climate change and its impacts, as well as create the opportunities for citizens to engage in meaningful local decision-making about climate action. A stronger understanding of climate change, climate action, climate justice and the positive activities by the State would allow better engagement and buy-in from society into the process. The Citizens' Assembly demonstrated that there are potentially high levels of public support for policies that are explained and justified with a large degree of deliberation and public debate. Conversely, there are plenty of examples nationally and internationally where, when efforts at communication have been inadequate, broad resistance has resulted from changes imposed upon communities.

In addition, the Committee accepts that our younger citizens, who do not yet have a vote, will be directly affected by climate change throughout their lives. Children and youth have a greater understanding of the need for action to reduce emissions and to protect the environment. However the current curriculums do not focus enough on climate change and Geography, a critical subject for engaging on the topic has been removed as a core subject at Junior Certificate level. Thus, there are insufficient opportunities in the formal education system to learn about or to act on climate change. This chapter addresses that gap.

4.2 Recommendations of the Citizens' Assembly

There was no voted recommendation arising from the Citizens' Assembly in this area. However, one of the ancillary recommendations did pertain to the topic area as follows:

AR1: Greater emphasis should be placed on providing positive information to the public which encourages people to make changes to the aspects of their behaviour which impact on climate change. Such information should be targeted at all age groups using a wide variety of formats. The information provided should be focused on highlighting the economic, social, health and other benefits of taking action rather than focusing on the negatives associated with a failure to act.

The Committee agrees with this ancillary recommendation. In the remainder of this Chapter specific actions to address this are discussed.

4.3 Education

Education is key if the State is to effectively discharge the challenge of leadership in addressing climate change. There are many potential avenues for education that may improve both climate literacy alongside knowledge about and resulting in the uptake of solutions. The State has a clear role to play in this regard.

4.3.1 Formal Education

Children and future generations will be most impacted by climate change and it is imperative that they be given the necessary educational training on climate change and its consequences both nationally and globally. Such an education will equip them to make informed choices as they grow up. The Committee did not get the opportunity to formally review the curriculums for primary and secondary students as they pertain to the complex and interrelated physical, social and spatial aspects of climate science, adaptation and mitigation. However, the Committee recognises the importance of this aspect of formal education in order to properly equip the next generation for a life involving climate change. The Committee will ask the Department of Education and Skills and the National Council for Curriculum and Assessment (NCCA) to initiate a comprehensive review with relevant national experts, identified by the Climate Action Council and Environmental Protection Agency (EPA), of the curricula for primary and secondary education for adequacy of coverage and accuracy to ensure that the next generation is fully literate on the issues. The impact that Swedish schoolgirl Greta Thunberg had at the most recent UNFCCC COP [20] meeting is testament to the potential power of youth in mobilising for change, and shifting political priorities in support of climate action..

4.3.2 Informal education

Educational opportunity extends beyond the classroom. Adult and community education is about offering the conceptual assets and tools to address problems that concern us now. The process is best achieved through community, professional and citizen networks in what is commonly termed the non-formal sector. Important examples of such networks include the Irish Rural Link, Chambers Ireland, Social Entrepreneurs Ireland, Junior Chambers Ireland and Foróige. It is critical that such networks are engaged to ensure access to education and information for all. The adult and community education sector hold important knowledge in how best to engage in innovative ways with communities. In parallel with an assessment of formal educational and school curricula, the Committee recommends that the Department of Education and Skills with the NCCA engage adult and community education experts in 2019 to examine how to ensure the provision of improved education on climate change and climate action among adults, local businesses and communities.

4.3.3 The potential role of citizen science projects and approaches

The past decade has seen the development of numerous citizen science based projects in the arena of climate science. There are projects that variously:

- Enable the running of climate model simulations on desktop computers that contribute to the evaluation of event attribution statements (e.g. climateprediction.net);
- Involve digitisation of old marine log book data (e.g. oldweather.org) or meteorological data (e.g. weather rescue.org);
- Help to reclassify images of tropical cyclones (e.g. cyclonecentre.org) to help us understand the long-term changes in the intensity of these storms; and

[20] The United Nations Framework Convention on Climate Change (UNFCCC) hosted their 24th Conference of the Parties (COP24) meeting in Poland in December 2018 where Greta Thunberg demanded greater action on tackling climate change.

- Allow for the collection of phenological records of occurrence that have a long-standing tradition and help us understand changes in seasonality of plant growth.

Such citizen science projects allow participation in the co-creation of climate knowledge and serve to increase climate literacy. They can be integrated into the curriculum at various levels of education. For example, many of these initiatives would be well suited to transition year projects. The Committee sees value in the development and promotion of citizen science approaches as a way to increase climate literacy.

4.4 Communication

Citizens lead busy lives, and rarely is climate change foremost in their priorities or decision making. Furthermore, citizens receive information on climate change in a variety of ways which can be sporadic and incomplete. It is important that the scientific evidence is clearly and consistently communicated so that citizens can make informed choices on what is undoubtedly a complex set of challenges, as the Committee has learnt in the past six months. In addition, there is a cohort of people for whom historical actions by the State that had a climate change benefit such as the erection of wind turbines have caused deep community resentment. The State needs to learn from those mistakes to ensure they are not repeated.

There is a substantial communication effort required if citizens are to accept the need for changes to lifestyles. It is essential to communicate why this is necessary and the ways in which it is beneficial to all of us. The inertia represented by the status quo is hard to overcome. Given how dependent many households and businesses are on fossil fuels, it is clear that this is not an easy task. The Committee is concerned that, without effective and sustained communication and education strategies in place, the necessary policy and other interventions may quickly become unpopular leading to a substantial challenge in implementation.

4.4.1 Public Information Campaigns

As noted throughout this report, climate action will require the State to educate citizens on climate change, incentivise them to make transformative behavioural changes and encourage them to invest in new technologies. There is a need to communicate these issues clearly and consistently, to both the individual and communities. A whole of Government communications programme should be developed addressing the need to convey the challenges and opportunities, and promote the options and benefits on climate action. Public bodies need to accept, in particular, that just because the science on climate change may support certain actions it does not mean that public backing will follow suit. That is often not the case.

The Committee noted that to date climate change has featured very little in public information media and acknowledges that such campaigns can be very effective, for example, the Road Safety Authority's work on the impacts of road traffic accidents. The Committee sees the implementation of its recommendations as requiring a significant awareness-raising programme by Government. This is an issue that needs to be addressed by the Climate Action Council at an early stage. The Standing Committee on Climate Action should then consider this issue to ensure that a sustained programme of public information is put in place as soon as possible.

4.4.2 Broadcasting and the media

The Committee recognises the potential significant role of regulated licensed media in contributing to climate change leadership. Collectively the licensed public service, commercial, community and special Interest broadcasters have reach into every household and business across Ireland, and their online platforms have international reach to the diaspora, many of whom may return to live here over the coming years. These mediums and platforms are instrumental in communicating the messages of climate change, climate action and climate justice and, in the engagement of citizens in both the discourse, and the processes of implementing change. The Climate Action Council should give due consideration to creating their own online broadcasting platform for the dissemination of educational and informative content relating to climate change, climate action and climate justice.

The Committee had the opportunity to receive testimony from RTÉ[21] but remains concerned by the relative lack of climate change content and dedicated programming on RTÉ. That meeting also highlighted a range of opinions from the Committee as to whether pieces to support the roll-out of new policies should be commissioned directly by the State. Several members expressed substantial concerns that this may blur the editorial independence of RTÉ. At the same time RTÉ noted that until major new policies or developments occurred it was hard to justify significant commissioning of climate related pieces. Concerns were also raised around false balance that has been a negative feature of broadcast media in many countries and specific examples in the national context were raised by members of the Committee.

On matters of accepted scientific fact such as 'climate change is occurring and humans are responsible' there is a need to make this consistently clear in reporting on news and current affairs.

The Committee recognises the regulatory role of the Broadcasting Authority of Ireland (BAI) in establishing and enforcing legally binding content requirements on broadcast license holders, and is of the view that the public interest can be substantially served by the imposition of climate change content quotas on all licensed broadcasters as currently exists for news, current affairs and Irish language programming. The Committee further recognises the role of the BAI in the formulation of advertising codes and standards, and in maintaining oversight of broadcast advertising to minimise conflicts between the commercial interests of advertisers and the public interest. In this regard the Committee will make recommendations for the formulation of Codes, which ensure that revenue generated to broadcasters from vested industry sectors, cannot undermine the broadcasters obligations to climate change content, and that advertising cannot contradict or undermine Government climate action and climate justice policy. Furthermore the Committee also recognises the BAI function as regulator of on-demand audio-visual media services and recommends that the regulation of climate change, climate action and climate justice content, be provided under the relevant statutory framework. The Committee is of the opinion that the BAI is best positioned as regulator of mass media broadcasting, to provide the statutory oversight which balances the interests of all stakeholders and ensures fair, objective and truthful content whilst also providing for diversity of evidence and opinion in media. In particular the

[21] Committee on Climate Action hearing, 16 January 2019 with RTÉ. Transcripts available at: https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_climate_action/2019-01-16/debate/mul@/main.pdf [accessed on 05.03.2019]

Committee is of the view that the BAI should, by the end of 2019, develop guidelines and measures around climate change broadcasting and on-demand service distribution to ensure comprehensive and accurate coverage of climate change, which should include the following:

- Amending all open rounds of the Sound and Vision Scheme to include themes on climate change, climate action and climate justice;
- Making provision in the Licensing Plan for Special Interest Broadcast and/or Community of Interest Licensing under the broad category of climate change;
- Reviewing all specific and general communication and compliance Codes for Licensees to ensure fair, objective and truthful climate content, whilst also providing for diversity of opinion and perspective in media;
- The Authority should also report to the Standing Committee on Climate Action to discuss Codes of Practice on advertising and provide guidance on mitigating undue influence of industry sector interests on media content; and
- Consider providing for a ring-fenced percentage quota of programming on climate change content, in addition to the existing quotas for News and Current Affairs Programming**.**

The Committee acknowledges that there was not time to consider evidence from other media industry sector interests such as print and digital media, and proposes to invite contributions from other content creators and platforms during the course of 2019.

4.4.3 Met Éireanns' reporting on impact of climate change on our weather patterns

The Committee notes the critically important weather service provided by Met Éireann and in particular its trusted position in respect of weather forecasting and reporting. The handling of a string of extreme events in the past 18 months such as Hurricane Ophelia and the Beast from the East has highlighted this valuable role to society. The Committee was concerned that historically Met Éireann has often been perceived as being reluctant to engage in public debate about climate science, and in particular the attribution of global warming to extreme weather events. The Committee was encouraged by the evidence from Met Éireann that placed on the public record their agreement with the consensus position of IPCC on climate change.[22] They were further encouraged by the stated plans to improve communication and presentation of climate information and make operational event attribution-style statements that are key to making the issues accessible to the public. The Committee notes the need to collaborate with experts in academia and internationally to optimize such services (Chapter 5, *Unlocking potential*). The Committee encourages Met Éireann to take a stronger role as the trusted source in weather forecasting to, where scientifically appropriate, link the changes we see to climate change and fully reflect the scientific consensus represented by the IPCC reports in their communications around climate change. To this end, the Committee would encourage the development of a dedicated climate communications section within Met Éireann alongside increased resourcing of their climate science activities and an intensified programme of collaboration with academia across Ireland (Chapter 5, *Unlocking potential*).

[22] Committee on Climate Action meeting with Met Éireann on 16 January 2019. Debate available at: https://www.oireachtas.ie/en/debates/debate/joint_committee_on_climate_action/2019-01-16/2/ [accessed on 22.03.2019]

4.5 Priority recommendations of the Committee

The Committee makes the following recommendations:

1 The Department of Education and Skills should by the end of 2019, in consultation with the National Council for Curriculum and Assessment (NCCA) and other relevant experts, review the curriculums for primary and secondary education for coverage and accuracy to ensure that students are fully literate on climate change and its potential impact. (Section 4.3.1)

2 Government Departments as part of the all of government approach to climate change should, before the end of 2019, develop and launch public information campaigns on the need to take action to address climate change, challenges and opportunities. (Section 4.4.1)

3 The Broadcasting Authority of Ireland should, by the end of 2019, develop guidelines and measures to encourage and facilitate climate change broadcasting and on-demand service distribution to ensure comprehensive and accurate coverage of climate change. (Section 4.4.2)

4 That Met Éireann takes a more proactive role as the trusted source in weather forecasting to, where scientifically justified, link specific events to climate change. Furthermore, Met Éireann should consistently reflect the scientific consensus represented by the IPCC. To this end, the Department of Housing, Planning and Local Government should resource a dedicated Climate Communications Section within Met Éireann. (Section 4.4.3)

Chapter 5: Unlocking potential

5.1 Introduction

The transition to a net zero emissions economy will require new technologies, innovation and efficiencies across all sectors, and there is great potential for new business models that meet consumer demands with no climate impacts. Ireland is well placed to develop solutions that will be required to meet the challenges of climate change. In the post-carbon age, the Committee is of the view that Ireland has the opportunity to be an exporter of both energy and climate change solutions in many sectors representing a real national economic opportunity in the 21st Century. For example, in our agriculture sector, we have the potential to show leadership in transitioning the sector to a lower carbon model. Ireland has a strong tradition in Research and Development (R&D) and supporting R&D in the area of climate action can make Ireland a world leader in rolling out climate-friendly solutions. Furthermore, the EU has recently pledged that in the next budget round, one in every four euros of the Commission budget shall be spent on climate action, representing significant market opportunities.[23] In addition to direct economic opportunities, many of these low-carbon solutions offer improved health (e.g. better air quality) and quality of life (e.g. warmer homes, lower energy costs) for citizens.

5.2 Citizens' Assembly recommendations

There were no direct recommendations arising from the Citizens' Assembly on the matter of unlocking potential. However, the Citizens' Assembly Report does make clear that citizens were cognisant not just of the challenges but also the opportunities that climate leadership may entail.

5.3 Economic opportunities from the transition to a low-carbon economy

We currently spend hundreds of millions of euros importing fossil fuels. Moving to a low-carbon economy would enable us not just to keep that money within the national economy to the benefit of all, but would open up significant employment opportunities for skilled jobs. For example, retrofit programmes at the likely scale required (Chapter 9, *Built Environment*) offer huge job creation and new business opportunities. In 2017 alone, Exchequer investments of €70 million in building energy upgrades supported more than 2,000 jobs across Ireland.[24] The Committee supports upskilling workers to benefit from the future increase in jobs in this area. Similarly, renewable energy deployment (Chapter 7, *Energy*) has the potential for significant employment opportunities for skilled workers. There are many other examples of significant employment opportunities that will arise from the transition to a low-carbon economy.

[23] Roth, C., n.d. *Swedish student leader wins EU pledge to spend billions on climate* [online]. Available at: https://mobile.reuters.com/article/amp/idUSKCN1QA1RF [accessed on 22.03.2019]

[24] Marie Donnelly at Committee on Climate Action hearing on 20 September 2018. Debate available at: https://www.oireachtas.ie/en/debates/debate/joint_committee_on_climate_action/2018-09-20/2/ [accessed on 22.03.2019]

5.3.1 Research and development (R&D) into climate solutions

The Committee heard valuable evidence from a range of experts on current efforts on R&D projects looking at the potential to develop solutions to climate change. Several Science Foundation Ireland (SFI) research centres have a focus on sustainability and climate change mitigation issues. Active research is ongoing in application areas as diverse as marine energy, rock crushing based carbon sequestration and smart agriculture. Teagasc also presented the considerable body of work that they have both undertaken and plan to undertake in the area of climate-smart agriculture.

Climate change is a long-term problem requiring a long-term perspective. Ireland should be looking to develop a range of approaches to supporting innovation, some of which may take a long-time to mature or which may be high-risk/high-reward rather than simply playing safe and deploying solutions only once developed by others and economical to roll out. As such, the Committee sees value in strategically strengthening our efforts in R&D on climate solutions. Focusing investment on the Just Transition and development of technologies to mitigate climate change has many potential benefits including:

- It directly addresses our climate change obligations in a way that generates new wealth and business opportunities in an equitable manner;
- It lowers the overall cost burden to the economy of meeting our EU climate obligations; and
- It generates jobs and a potential export industry (or industries), since this is a global problem where most (if not all) jurisdictions will be looking for innovative solutions to mitigate climate change. In this respect, Ireland can be a world leader in specific technology areas, and already is in certain areas such as:
    - Integration of renewables onto a relatively isolated grid (comparatively mature)
    - Ocean energy (relatively immature).

It is clear that the State cannot directly finance R&D into all the technological solutions that will be required. Hence the Committee recommends a programme of substantial targeted investments, with priority given to those areas with the highest mitigation potential and the possibility to export the technology and knowledge internationally. There will be a need for these priorities to be reviewed and thereafter periodically reappraised. Initial candidates would include, but not be limited to: peatland restoration, sustainable agriculture, enhancing the circular economy and the Just Transition, coastal carbon sequestration and ocean energy. In many cases, these projects require long-term investment plans with limited scope for immediate returns to private investors. As such, the State must take the lead in investing in and coordinating the large-scale projects.

The Committee believes that had they the chance to hear from a broader range of experts, additional opportunities well suited to Ireland would have been highlighted. The consideration of further opportunities for national leadership in development of solutions needs to be followed up on by the Standing Committee on Climate Action.

5.3.2 Realising the benefits of currently developed solutions

As well as investing in new and novel tools and techniques, there is a need to realise the export potential of current success stories. Ireland has developed a number of climate-smart agriculture technologies and initiatives. We should be exporting this knowledge, where it is proven to be successful in reducing emissions, if we are to help international efforts to mitigate climate change.

Lord Deben in his evidence to the Committee, on behalf of the UK Climate Change Committee, highlighted the export potential of much of this work to improve cattle production efficiency globally and to reduce emissions.[25] Similarly, the success of Eirgrid in managing a large proportion of intermittent power sources on a still relatively isolated grid will be of interest to a large number of countries that face similar challenges. The view of the Committee is that we need to better champion our success stories to date and encourage the uptake of these solutions globally that offers both export opportunities and permits us to show leadership in addressing the challenges of climate change.

5.3.3 Supporting enterprise

There is an ongoing need to incentivise carbon friendly enterprise in particular the development of the low carbon economy. The Committee notes the provision of a €500 million Disruptive Technologies Innovation Fund as part of the NDP where applications must align with research priority areas including "Decarbonising the Energy System" and "Sustainable Living". In addition the Committee notes that the IDA and Enterprise Ireland also support businesses trying to improve energy efficiency and to invest in renewable energy. It is clear that there is a substantial effort required across a number of Government Departments, public bodies and agencies in the area of developing and deploying climate change solutions. However, funding is split across multiple funding bodies and institutions leading to challenges in coordination. The Committee recommends that the Department of Business, Enterprise and Innovation (DBEI) review the current funding landscape in 2019 in order to determine whether it can be streamlined and better coordinated so as to better meet the State's aim of being a leader in addressing climate change.

There are also many international low-carbon business innovations being put in place which require the ongoing support of the State. An example is the Renewable Energy or RE100 Campaign run by the Climate Group, whereby the aim of the business is to reach 100% renewables. These companies drive ambition in climate action in the business community and in society in general. The Committee wants the DBEI and the IDA to support this programme and continue to assist in rolling it out to other enterprises operating here. The Committee also notes opportunities provided by digital technologies and broadband services to expand remote-working practices, either from home or through dedicated co-working spaces. Such practices allow for reduced commuting and car-usage which can offer several co-benefits, including reductions in transport emissions. The Committee recommends that the DBEI carry out analysis in 2019 on the advantages of, and obstacles to, remote-working practices, including in the context of the State's climate commitments. Based on the findings of this analysis, the DBEI should produce a strategy to support remote-working and smart community schemes and ensure improved coordination and engagement from relevant Government agencies.

[25] UK Climate Change Committee gave evidence to the Committee on Climate Action on 19 December 2019. Transcripts available at: https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_climate_action/2018-12-19/debate/mul@/main.pdf [accessed on 12.03.2019]

5.4 Investing in research into climate change across the sciences and humanities

Even if all nations are successful in aggressively controlling emissions of GHGs, there shall be some further change in the global climate. We have yet to experience the full climate impact of the GHG emissions which have already occurred. We have been fortunate that several recent major windstorms struck at low tide such that the storm surge did not lead to flooding of one or more of our major cities. Although the Committee did not get time to go into detail on adaptation issues, it is recognised that adaptation measures may have high costs and that it is important to get the risk analysis right. The key to this is having the best possible data, models, and tools available to inform understanding and decision making. Ireland should improve its participation and contributions to international scientific fora such as the IPCC. Other countries of similar population and economic status such as Norway and Switzerland have had far greater representation in such activities and have one or more large and, critically, interdisciplinary climate centres. These centres contribute to advancing international knowledge and provide the science that underpins adaptation and risk reduction. In Ireland we currently have too few expert climate science and climate policy practitioners. The Committee recommends that the Department of Education and Skills and relevant third-level institutions along with relevant public bodies including Met Éireann and Teagasc should seek to both nurture home-grown talent and attract leading international scholars in the areas of climate change and climate change adaptation. This will ensure the provision of a robust research base to underpin a climate resilient economy and society. It is important that such research is not confined to any one aspect of academia, as contributions can and should be made from all relevant fields of academia (including science, social science and the humanities). Existing research funding streams should be expanded where appropriate to make climate change research projects from the humanities eligible for funding. Appropriate structures should also be put in place. The Government should advance a plan to enable a step-change in national capabilities as part of the all of government approach (Chapter 1, *The need for a new national framework*) starting with budget 2020.

5.5 Leadership in international development

Climate change poses the single biggest threat to the achievement of Sustainable Development Goals. Notwithstanding its slow progress on domestic action to date, Ireland has played a prominent role on climate action internationally. Ireland is recognised for championing the needs of the most marginalised people and the most vulnerable countries by providing support to the Least Developed Countries Expert Group of the UNFCCC, and contributing to EU and OECD work in this area. Ireland, through the Department of Foreign Affairs and Trade, is increasing its focus on the role of women as agents of change and gender justice in terms of international climate action through work at COP24 and beyond. Climate Action has been given strong emphasis in the Department's new Policy on International Development, *A better world* which was launched recently. This includes:

- a commitment to 'future proof' the entire development assistance programme, taking climate factors into account across all interventions and partnerships;
- increasing the allocation of funds to climate action, and specifically explore opportunities for

innovation on risk management; and

- a greater focus on climate resilient food systems and oceans.

Ireland has also shown strong leadership in international climate finance, principally through the Irish Official Development Assistance (ODA) programme, administered by Irish Aid (a division within the Department of Foreign Affairs and Trade). In 2017 it provided €55 million in climate finance, an increase from €50.6m in 2016, leaving Ireland well on track to achieve the Programme for Government commitment of €175m in total climate finance by 2020. Ireland was recently recognised as the second most transparent donor of climate finance by the German NGO Adaptation Watch. [26] The Committee recommends that the Government further strengthens Ireland's role in climate action engagement in the Least Developed Countries.

Whilst it is critical that climate change adaptation and mitigation measures are integrated into all relevant ODA programmes, increased climate finance should not come at the expense of other priority areas of ODA. The Government should respect commitments for Annex I countries under the UNFCCC in providing "new and additional financial resources" for addressing climate change.

5.6 Benefits to our health from climate action

Actions to cut air pollution bring immediate health co-benefits. Air pollution is the number one environmental risk of early death and is considered by the World Health Organisation (WHO) as a "global public health emergency". In an Irish context, key ways to improving our indoor and outdoor air quality are to stop burning coal and peat, reduce our reliance on petrol and diesel cars, and improve the energy efficiency of our buildings.[27]

In addition to the direct health benefits, tackling climate change will also ensure that future generations avoid some of the negative living conditions that are associated with rising temperatures. In that regard we know that rising temperatures, especially in summer bring with them the potential for the increased incidence of food (e.g. *Salmonella*) and water-related infections[28] as well as a rise in Lyme's disease and increased risk of new pests and vector-borne diseases surviving and thriving in Ireland. Hotter summers may also lead to increased heat-related mortality (as a result of more heatwaves in cities) and greater risk of skin cancer. We know too that global warming is already responsible for more frequent extreme events which also bring with them a higher risk of injury or death. The resilience of the State to global warming, from a health perspective, is a matter that should be examined by the Standing Committee on Climate Action when it examines the adaptation strategies of the health sector.

[26] Adaptation Watch, 2016. *2016 Adaptation Finance Transparency Gap Report* [online]. Available at: https://static1.squarespace.com/static/56410412e4b09d10c39ce64f/t/581af8272e69cfd82f8a834a/Round%20I/AW_Report_Place%20Text.pdf [accessed on 05.03.2019]. Table 4.1, page 47

[27] Carrington, D., 2018. Air pollution: everything you should know about a public health emergency. *The Guardian* [online]. 5 November. Available at: https://www.theguardian.com/environment/2018/nov/05/air-pollution-everything-you-should-know-about-a-public-health-emergency [accessed on 22.03.2019]

[28] Royal Irish Academy (RIA), n.d. *7th Scientific Statement Climate Change and Health in Ireland* [online]. Available at: https://www.bordbia.ie/consumer/gardening/GardeningArticles/ScientificArticles/7th_Scientific_Statement_Climate_Change_And_Health.pdf [accessed on 22.03.2019]

5.6.1 Reducing vehicular pollution

Major benefits from eliminating fossil-fuelled vehicles from our cities include better air quality, more space for other activities such as walking, cycling, playing and community areas and reduced crashes and accidents. A healthier environment with cycling and walking lanes helps to promote and increase levels of physical activity which in turn can help to reduce levels of obesity and type 2 diabetes.[29]

5.6.2 Retrofitting the homes of the most vulnerable

Those experiencing energy poverty tend to live in homes with poor energy performance and are more exposed to negative health impacts associated with cold and damp living conditions. Dealing with energy poverty requires a multi-faceted set of policy measures. While energy efficiency improvements alone are not sufficient to lift a household out of poverty, improving the energy performance of a home should reduce the energy bill and improve the health conditions within the household.[30]

5.7 Case Study: Warmth and Wellbeing Scheme

Launched in 2016, the Warmth and Wellbeing Scheme is a pilot project which ran for three years from 2016-2018. It provided extensive energy efficiency upgrades free of charge to the homes of people over the age of 55 and for families with young children in the Dublin 8, 10, 12, 22 and 24 (Health Service Executive [HSE] Community Health Area 7) areas who are in energy poverty and living with respiratory conditions (and in receipt of the fuel allowance or one-parent payments).

A joint project, the scheme was funded by the Department of Communications, Climate Action and Environment (DCCAE) (€20 million) as a part of the Governments Strategy to Combat Poverty and was delivered by the SEAI and HSE in collaboration with the Department of Health and the Healthy Ireland initiative. By 18 December 2018, €19.26 million had been invested to upgrade 886 homes. The average cost of retrofitting was €22,000 per home.[31]

Ireland has some of the highest rates of respiratory illnesses in the world. Chronic Obstructive Pulmonary Disease (COPD) is the 3rd highest cause of death and the most common cause of emergency hospital admissions among adults in Ireland. According to COPD Support Ireland, one in five children suffers from asthma[32]. Damp homes and poor air quality are universally regarded as key contributing factors to both conditions. The scheme aimed to improve the internal air temperature and air quality in participant's homes by retrofitting which should ease the symptoms of people with respiratory illnesses and potentially reduce their need to access health services. It also hoped to boost social inclusion and school performance (through reducing missed school days) for children with asthma. Additional benefits included warmer more comfortable homes, lower energy bills, displacement of fossil fuels and creating local jobs in construction.

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[29] Klein, A. 2018. The road reimagined. *The New Scientist.* 27 October 2018. Pages 22-23

[30] MaREI, 2018. *Note to Joint Oireachtas Committee on Climate Action* [online]. Available at:https://data.oireachtas.ie/ie/oireachtas/committee/dail/32/joint_committee_on_climate_action/submissions/2018/2018-12-12_submission-marei-centre_en.pdf [accessed on 12.03.2019]

[31] Written answer to a parliamentary question (Ref No.: 4862/19), 31 January 2019

[32] COPD, 2017. *€10 million expansion to make Dublin homes warmer for COPD. Minister Denis Naughten announces €10 million expansion to make Dublin homes warmer, Pilot Scheme extended to include Dublin 8, 10, 12, 22 and 24*. 2 February. [online]. Available at: http://copd.ie/e10-million-expansion-to-make-dublin-homes-warmer-for-copd/ [accessed on 12.03.2019]

The Scheme was designed to objectively measure and validate, in an Irish context, the strong international evidence that the provision of extensive energy efficiency upgrades to homes can have a positive effect on the health and wellbeing of people in fuel poverty and living with chronic respiratory illnesses. The London School of Hygiene and Tropical Medicine was commissioned in April 2017 to assess the success of the scheme. In collaboration with the HSE, this research project will assess, among other things, the changes in hospitalisation rates, mortality, mental health and stress levels experienced by participants (i.e. the impact the scheme is having). The research has proceeded in parallel with the scheme and work is underway to provide a preliminary report on the scheme early in 2019 and a final research report in 2021.

The feedback from the majority of scheme participants to date is positive. Interim findings will help guide future decisions on the scheme. From a health perspective, independent evidence of the scheme's effectiveness will help in considering the potential for a wider roll-out. The Committee notes that DCCAE is engaging with the HSE to examine potential for the implementation of this scheme in rural areas.

5.8 Priority recommendations of the Committee

The Committee recommends:

1. Developing climate change solutions represents an opportunity to show leadership and to progress economic and social opportunities. Starting with the budget for 2020, a program of substantial R&D investments should be instigated focusing upon developing solutions to climate change. Priority should be given to those areas and technologies where there is the greatest potential for mitigation and adaptation. (Section 5.3.1)

2. The Department of Health should carry out a review of the health risks associated with climate change and benefits associated with climate action. The results of this review and the preliminary report on the Warmth and Wellbeing Scheme should both be published by June 2019. Following this publication, if the evidence supports it, the HSE and DCCAE should bring forward a proposal on a national roll-out of the Warmth and Wellbeing Scheme. The Minister for Communications, Climate Action and Environment and the Minister for Health should report their progress on these matters to the Standing Committee on Climate Action no later than end Q2 2019. (Sections 5.6, 5.7)

Chapter 6: Incentivising Climate Action

6.1 Introduction

The Government must ensure that a balanced and equitable package of necessary financial incentives and instruments are put in place. These will need to be maintained for a sufficient period in order to make less polluting choices attractive, accessible and affordable for businesses, organisations and citizens so as to facilitate a societal shift to a low-carbon economy. These include both improved access to funding opportunities, grants and loans, but also pricing interventions to signal the much needed behavioural and investment change. The changes must be made at a pace and in such a way that the most vulnerable in society are protected. They must also be clearly communicated to the public to ensure the greatest possible level of public acceptance and uptake.

It is important to stress that there are substantial economic challenges associated with the alternatives of doing nothing or undertaking insufficient efforts to address climate change.[33] The IPCC has warned consistently of the negative long-term economic impact of delayed actions in reducing GHG emissions. The State will soon have to purchase compliance with EU targets for non-traded emissions and renewable energy targets and will need to continue to do so for as long as we continue to miss our international emissions targets. Such expenditure represents money lost from the public purse that could be employed in any number of ways, not limited to climate action, for the benefit of society. Furthermore, in 2017 Ireland imported 66% of all its energy requirements (made up almost entirely of fossil fuels – oil, gas and coal).[34] The net impact is that millions of euros are lost to the national economy every week. Reducing fossil fuel usage by investing in domestic-based renewable energy solutions keeps that money in the national economy, increases the overall tax take to the Government for public use, and creates jobs in a broad range of areas.

6.2 Recommendations of the Citizens' Assembly

The Assembly made a number of recommendations that are sector specific, such as increasing investments in electric vehicles (EVs). The Committee has dealt with and responded to those recommendations in the relevant sectoral chapters. Examples include:

- Chapter 2 (*Just Transition*): specific measures to include greater support, in the first instance, for those impacted by the cessation of peat extraction in the Midlands;
- Chapter 3 (*Citizen and community engagement*): greater resources for Community Energy Groups and local authorities to assist citizens with transition to low carbon lifestyles;
- Chapter 7 (*Energy*): Improved schemes for uptake of solar photo-voltaic (PV) to private dwellings and small businesses and measures to incentivise micro-generation;

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[33] Central Bank of Ireland, 2019. *Slow transition to a low carbon economy poses macroeconomic and financial stability risks – Governor Philip R Lane* [online]. 5 February. Available at: https://www.centralbank.ie/news/article/climate-change-irish-financial-system-governor-lane-5-Feb-2019 [accessed on 24.03.2019]

[34] This figure is down from 88% in 2015 as a result of the start of natural gas production from the Corrib gas field. However, this high level of production from the Corrib gas field is expected to taper off significantly in the next couple of years. SEAI, 2018. *Energy in Ireland 2018* [online]. Available at: https://www.seai.ie/resources/publications/Energy-in-Ireland-2018.pdf [accessed on 21.01.2019]

- Chapter 8 (*Agriculture, Forestry and Peatlands*): Reward farmers through the next Common Agricultural Policy (CAP) for carbon smart farming and land use diversification;
- Chapter 9 (*Built Environment*): targeted retrofitting help to those using peat, coal and oil; and
- Chapter 10 (*Transport*): Cheaper and more efficient public transport and greater investment in EV's and the EV charging network.

The Citizens' Assembly made the following recommendation in relation to carbon tax:

R.3: 80% of the Members said they would be willing to pay higher taxes on carbon intensive activities, subject to the following qualifications;

1. *Any increase in revenue would be only spent on measures that directly aid the transition to a low carbon and climate resilient Ireland: including, for example, making solar panels more cheaply and easily available, retrofitting homes and businesses, flood defences, developing infrastructure for electric vehicles.*
2. *An increase in the taxation does not have to be paid by the poorest households (the 400,000 households currently in receipt of fuel allowance).*
3. *That these taxes build year-on-year.*

The cross sectoral recommendations made by the Citizens' Assembly were:

R.2: 100% of the Members recommended that the State should take a leadership role in addressing climate change through mitigation measures, including, for example, retrofitting public buildings, having low carbon public vehicles, renewable generation on public buildings and through adaptation measures including, for example, increasing the resilience of public land and infrastructure

R.4: 96% of the Members recommended that the State should undertake a comprehensive assessment of the vulnerability of all critical infrastructure (including energy, transport, built environment, water and communications) with a view to building resilience to ongoing climate change and extreme weather events. The outcome of this assessment should be implemented. Recognising the significant costs that the State would bear in the event of failure of critical infrastructure, spending on infrastructure should be prioritised to take account of this.

Because of time constraints, the Committee was not in a position to examine adaptation measures to the required level of detail and therefore the extent to which such measures are sufficiently comprehensive, and the financial measures needed to address critical infrastructure in particular will be a matter for the Standing Committee on Climate Action. The responses to the remaining recommendations are discussed below.

6.3 Public expenditure policy

The National Development Plan (NDP) has provision for an investment of €30 billion between 2018 and 2027 in climate action and sustainable transport. The NDP has a number of important policy provisions relating, for example, to the Moneypoint power station which will stop using coal to generate electricity by 2025 at the latest, and the future ban on the sale of new petrol and diesel cars after 2030. The Department of Communications, Climate Action and Environment has assessed that the NDP investments could potentially contribute a cumulative reduction in

emissions of 22 $MtCO_2$-eq by 2030. However, that will only achieve one-third of the emission reductions needed to meet EU 2030 emissions targets in the non-Emissions Trading Sector.

The Committee was informed that the Department of Public Expenditure and Reform expects to issue a revised Spending Code shortly. This will require all public projects to price any future GHG emissions at the estimated costs that society will have to bear in reaching climate change targets. The Department is proposing a shadow cost of carbon that will reach €32 a tonne by 2020, €100 a tonne by 2030 and €265 a tonne by 2050. The Committee welcomes this review and is of the opinion that all new public projects should immediately use this costing approach.[35]

The Committee is concerned that the emissions reductions which may be achieved by each specific investment or infrastructure decision are not specified in the NDP and no overall assessment was carried out of the impact of the planned infrastructure on Ireland's climate obligations. It is the view of the Committee that the full suite of large investment projects contained in the NDP should now be subject to quantitative assessment by the Delivery Board for their mitigation impact and potential, and the results should be published as soon as possible. The Climate Action Council should, in turn, be in a position to report to the Standing Committee on Climate Action on whether the State is maximising investment in sustainable low carbon infrastructure. As outlined in evidence, in particular from MaREI, expediting the development of major projects with a potential to realise large emissions reductions, such as those relating to public transport infrastructure, will result in bigger cumulative impacts thus shaving more off our current 2030 emissions gap. Such an approach would place us in the best possible position to meet our international climate and energy obligations.

6.4 Climate Action Fund

The Climate Action Fund is one of four funds established under Project Ireland 2040[36] and will support initiatives that contribute to the achievement of climate and energy targets. This Fund has a provision of at least €500 million and, taken together with the Rural Regeneration & Development Fund (€1 billion available in the NDP) there are now dedicated funding mechanisms that can address our GHG emissions. The fund should encourage different players from both the public and private sector to come up with innovative proposals in a competitive environment. The Fund should also provide dedicated funding for community groups to encourage innovative change at local level. The competition for funding is, in the view of the Committee, a good way of getting proposals that come from self-organised communities at a local level and therefore have a better chance of delivering good outcomes. The Committee recommends that a review of the eligibility criteria and the projects financed by the Climate Action Fund should be undertaken by the Department of Communication, Climate Action and Environment at regular intervals (and, where necessary, it

[35] In practical terms, this means a new shadow price of carbon for non-ETS emissions of €32 per tonne in 2020, rising by €6.80 a year to reach €100 per tonne by 2030, according to the proposed final Shadow Price of Carbon Consultation Paper prepared by the Department of Finance in Nov 2018 https://igees.gov.ie/wp-content/uploads/2018/11/Valuing-Greenhouse-Gas-Emissions.pdf [accessed on 23.03.2019]

[36] Project Ireland 2040 comprises two reports – the National Planning Framework (NPF) and the National Development Plan 2018-2027 (NDP). The Department of Housing, Planning and Local Government on behalf of the Government is responsible for the NDP and NPF. The NDP is the 10-year, €116 billion programme underpinning the NPF. This is explained further in Appendix 5 of this Report.

should receive extra resources). The outcomes of such reviews should be referred to the Standing Committee on Climate Action.

6.5 Aiding citizens in making the transition

As outlined in Chapter 2, *Just Transition,* a fair transition is required. As further outlined in Chapter 3, *Citizen and community engagement*, there is a need to provide tailored advice to citizens which can best be provided at the local level. These activities will only work if appropriate financial mechanisms are provided for citizens to avail of. The Committee recognises that only a minority of citizens have funds on hand to immediately implement all of the required changes. In that regard, the Committee recognises that a distinction must be drawn between citizens who, over a period of time, may be expected to repay some or all of the capital investment required and those for whom the State must fund the work in its entirety and from whom repayment cannot be reasonably expected.

6.5.1 The continuing role of grant payments

There are currently numerous grants and programmes aimed at aiding the transition. The Committee believes that there would be value in the SEAI (along with Energy Agencies and any other bodies which offer financial assistance for climate friendly measures) re-evaluating the effectiveness and equity of current grant schemes. These grant-aided efforts need to be optimally targeted if they are to aid a Just Transition. In particular the review should seek to ensure that it is enabling the maximum number of low and ordinary income households to undertake retrofitting of their homes, to purchase EVs and to pursue additional energy efficiency measures. We should learn from mistakes of other countries whereby grants have benefitted the top earners disproportionately, for example, the feed-in tariffs in the UK missed out lower earners almost completely.

6.5.2 The potential role of low cost financing options

Grants that only partially pay for climate actions on the part of citizens leave open questions around how citizens can co-fund the remainder. Private loans can be prohibitively expensive and act as a drag on the uptake of solutions. Instead of grants, for a large cohort of society, access to long-term very low interest loans would enable better engagement in activities such as deep retrofitting or EV purchases. Grants can also potentially lead to price gouging by providers, whereas loans are less likely to do so.

There are a range of European funded finance tools such as PF4EE (private finance for energy efficiency and smart finance for smart buildings). The Strategic Banking Corporation of Ireland (SBCI) currently provides loans to farmers and SMEs using such a European facility (i.e. European finance guarantee fund) and Exchequer funding. An SBCI retrofit and EV purchase loan facility could provide attractive, unsecured loans via normal credit institutions through provision of de-risking and/ or interest rate subsidy. These loans should be priced at similar or lower than current mortgage rates, and should require specific professional energy assessments, advice and sign-off. The example cited to the Committee was the KfW bank in Germany (Energy Efficient Construction and Refurbishment in Germany retrofit programme) which is a public bank, backed by State guarantee, and so has AAA rating for borrowings. It lends for retrofit at interest rates of between

1.49% and 1.5%, which makes taking out a loan an attractive proposition especially when the annual energy cost saving is taken into account.

The Committee is of the view that a similarly innovative approach is needed here in order to drive the retrofit programme and EV transformation needed to make the majority of houses in Ireland energy efficient and reduce our transport sector emissions. The Committee recommends that the Department of Finance initiate a review in 2019 to examine a suite of innovative low interest financing options such as:

1. A de-risked loan facility for deep retrofit through the SBCI;
2. Green mortgages and low cost loans from An Post and Credit Unions;
3. *'Pay As You Save'* type measures, whereby householders could pay back on retro-fitting costs through their energy bills which should be mandated by the Commission for Regulation of Utilities; and
4. A deferred repayment Loan Scheme, operated by the local authorities, for low income home owners, which would not have to be repaid in the lifetime of the householder.

6.5.3 The importance of choice

The Committee is aware that the circumstances of each individual will differ, and therefore is of the view that a greatly expanded range of options should be made available to citizens. The two fundamental tools available are grants and low interest loans as noted in the previous two sub-sections. These are not either / or propositions, and a mix of options should be made available to suit individuals' needs and circumstances. The Government as part of the all of government approach, via the Departments of Finance and Communications, Climate Action and Environment, should take the lead in developing a suite of such options and appropriate qualification criteria that are consistent with the concept of a Just Transition (Chapter 2). The local one-stop-shops (Chapter 3, *Citizen and community engagement*) should provide tailored advice to citizens that clearly outline the range of options available to support citizens in making the most appropriate investment for their particular circumstances.

6.6 Carbon pricing

6.6.1 Theoretical basis

The impact of GHG emissions hits the whole of society, and future generations. The price of fossil fuels and products derived from them is primarily related to extraction and production costs and does not, yet, fully reflect the long-term cost of the damages that shall arise from continued climate change. The adverse effects of GHG emissions fall on society collectively rather than on those responsible for their emission which, in economic terms, is referred to as an externality. Unless the social cost is fully incorporated into the price of fossil fuels, and our dependence on them is rapidly eliminated, future generations will ultimately bear the cost of our ongoing pollution.

The Committee accepts that the best (most efficient and equitable) way of addressing this is to put a price on the externality, which is the basis for carbon pricing. The Committee heard this from

many of the expert witnesses. The IPCC Fifth Assessment Working Group 3 Report assessed the issue in 2014 as follows:[37]

> ***Public revenues can be raised by collecting carbon taxes and by auctioning carbon allowances*** *(high confidence). Putting a price on greenhouse gas (GHG) emissions, through a carbon tax or emissions trading, alters the rate of return on high- and low-carbon investments. It makes low-emission technologies attract more investment and at the same time it raises a considerable amount of revenue that can be used for a variety of purposes, including climate finance. These carbon-related sources are already sizeable in some countries. The consideration of alternative sources of public revenue like taxes on international bunker fuels has the potential to generate significant funds but is still in its infancy. Reducing fossil fuel subsidies would lower emissions and release public funds for other purposes [16.2.3].*

Carbon pricing is currently applied in about 40 countries. A recent article published in *Nature Climate Change*[38] written by pre-eminent experts in the field, and synthesizing in excess of 100 papers on the matter, provides a comprehensive overview of both the basis and the range of current practices. An accessible blog summary of this is available at https://ourworldindata.org/carbon-pricing-popular.

There is broad consensus in the expert and policy community that:

1. Carbon pricing is essential if we are to have a chance to meet our mitigation targets;
2. Carbon pricing alone is insufficient and must be preceded or accompanied by a raft of additional policy interventions that provide society with viable and affordable alternatives to carbon-intensive lifestyle choices; and
3. For public acceptability it is important that any carbon price be subject to hypothecation (ring-fencing the proceeds for a specific purpose) whereby funds are used transparently in a manner that is seen to aid the transition.

The article published in *Nature Climate Change* points to an emerging consensus that the fee and dividend approach is optimal, but notes that current models of carbon pricing use a combination of different approaches to revenue recycling (e.g. funding green actions and fee and dividend) (See Figure 1). This illustrates the need for a nationally appropriate use of the revenues raised.

[37] IPCC Fifth Assessment Working Group 3 Report, 2014. *Chapter 16, Cross-cutting investment and finance issues* [online]. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter16.pdf pp. 1210-1211 [accessed on 22.03.2049]

[38] David Klenert, Linus Mattauch, Emmanuel Combet, Ottmar Edenhofer, Cameron Hepburn, Ryan Rafaty & Nicholas Stern, 2018. Making carbon pricing work for citizens, , *Nature Climate Change*, volume 8, pages, 669–677

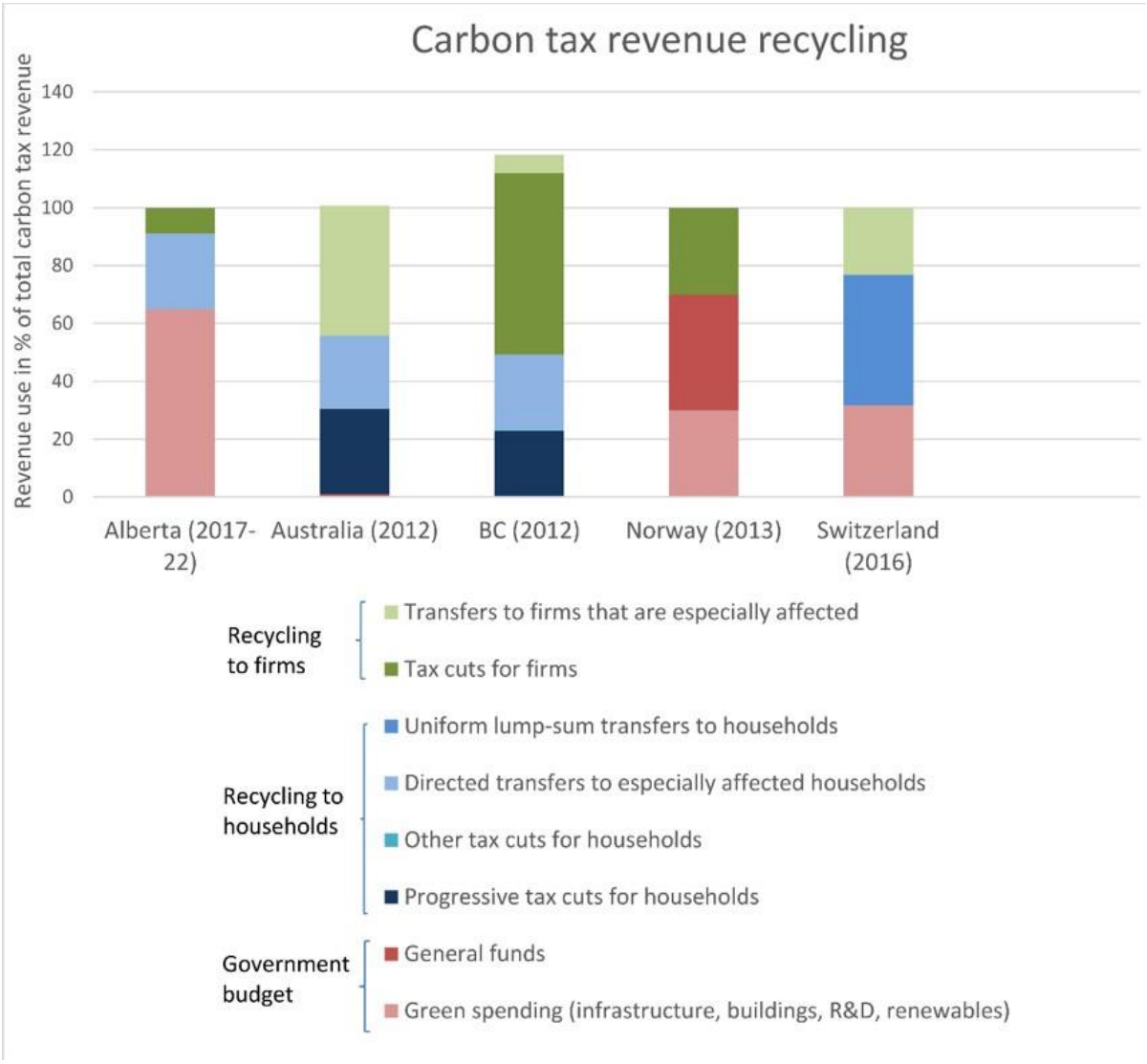

Figure 1: Summary of selected national and regional current carbon pricing models.[39] *These represent the range of approaches. Note that British Colombia (BC) requires more than 100% of revenue to be recycled.*

6.6.2 The national context

At present Ireland has a carbon tax of €20 per tonne which is paid by the importer or extractor on the carbon content of fossil fuels. Most of the tax is passed on to businesses and consumers. The view of the Climate Change Advisory Council, in accordance with the international consensus, is that the current level does not send a powerful enough signal to actors to lower emissions throughout the economy. The Committee accepts that this has to change. The Committee considers that a carbon pricing policy that contains a rising price trajectory to 2030 should form a component of our climate action policy moving forward. The Committee acknowledges the advice from the Climate Change Advisory Council that the price of carbon should rise to €80 per tonne

[39] taken from https://ourworldindata.org/carbon-pricing-popular and based upon Klenert et al., 2018 - Making carbon pricing work for citizens, David Klenert, Linus Mattauch, Emmanuel Combet, Ottmar Edenhofer, Cameron Hepburn, Ryan Rafaty & Nicholas Stern, Nature Climate Change, volume 8, pages, 669–677 (2018)

(index linked) by 2030. Credible commitments over the long-term are key if businesses, organisations and citizens are to make the necessary decisions to undertake action. Put simply, people need to be confident that they will see a long-term pay-back from their choices today when they invest in climate actions. From a public acceptance perspective it is critically important, in the view of the Committee, that carbon price increases be clearly communicated to businesses and the general public, and accompanied by significant education and communication efforts (Chapter 4, *Education and Communication*). Setting a trajectory for an appropriate carbon price also presents opportunities for the private sector as it will generate determination within the business community to reduce their energy use and develop greater innovation to invest in new greener technologies. It is already driving innovation in reducing transport emissions and in low carbon home heating options.[40]

In keeping with international expert consensus, the Committee agrees that there is a compelling case, in concert with any carbon price increase, for substantial Government investment and policy interventions to ensure a just and timely transition to a low-carbon economy. It is critical that carbon pricing is not seen as a solitary solution, but rather one component of a comprehensive package in which Government takes the lead on cutting emissions and making less polluting choices affordable and accessible for people (Sections 6.3 through 6.5). If climate change is caused by market failure, the State cannot leave the solutions entirely to the market. Market forces are driving higher rates of consumption and pollution and therefore the market economy itself must be transformed to give people real, low-carbon choices such as affordable public transport and sustainable livelihoods, whether they live in urban or rural environments, and facilitate community-led, non-market based solutions. Insofar as carbon pricing contributes to national climate policy, it must be to drive system change, encourage the adoption of new technologies, and discourage the use of fossil fuels.

6.6.3 Use of hypothecated proceeds from carbon pricing policy

At present the carbon tax raises approximately €440 million per annum and the proceeds go into the Central Fund as part of Exchequer revenue. The Committee is of the view that any increases in carbon pricing must be hypothecated by legislation and used in a transparent manner to ensure public acceptability. It is also of the view of the Committee that a reasonable call on general Exchequer funds to pay for State actions to support the transition to a low-carbon future is both justified and necessary for the foreseeable future irrespective of any carbon price increase.

The Committee heard that 28% of households experience energy poverty [41] and that poorer households spend larger portions of their budgets on heating than richer households. The Climate Change Advisory Council noted that while poorer households need to be part of any carbon pricing reforms introduced, they must be protected from the consequences of such reforms precisely

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[40] As per evidence heard by the Committee from Prof. John Fitzgerald, Climate Change Advisory Council, 12 Sept 2018. Debate available at: https://www.oireachtas.ie/en/debates/debate/joint_committee_on_climate_action/2018-09-12/2/ [accessed on 25.03.2019]

[41] DCENR, 2015. *A strategy to combat energy poverty* [online]. Available at: https://www.dccae.gov.ie/documents/A%20Strategy%20to%20Combat%20Energy%20Poverty.pdf [accessed on 07.03.2019]. Cited to the Committee in a submission from MaREI, available at: https://data.oireachtas.ie/ie/oireachtas/committee/dail/32/joint_committee_on_climate_action/submissions/2018/2018-12-12_submission-marei-centre_en.pdf

because they spend significant proportions of their budgets on energy for heating. Successive studies indicate that this is best dealt with by means of an appropriate increase in social welfare. However, there are different ways of measuring fuel poverty and it is vital that all vulnerable citizens are captured when calculating those in need of additional support such as increased fuel allowance. The Committee recommends that, prior to any increase in carbon taxation, the Government conduct a review in 2019 into the most appropriate measure of, extent and nature of fuel poverty across all cohorts and to include in this review the short, medium and long-term impact of increasing the carbon tax.[42] The priority for the State, in the view of the Committee, is to ensure that all necessary steps are taken to protect those who are unable to afford increased costs caused by rising carbon pricing. This should form a centrepiece of a carbon pricing policy that supports a Just Transition. It is essential to engage all citizens in accepting the need for an increasing carbon price.

> The Government should, prior to the introduction of any increase in carbon taxation, examine the impacts on low-income families and on the basis of these findings, introduce specific policy measures to assist those who may not be in a position to immediately transition from fossil fuels, including the potential use of social protection mechanisms, such as tax credits and welfare payments.

The Committee is in agreement that revenues from the increased carbon tax should not go into the central fund but be ring-fenced (or hypothecated) by legislation. The Committee further acknowledges that there are two main alternative uses for hypothecated carbon pricing revenues, which are not necessarily mutually exclusive:

1. Put the proceeds of the increased carbon tax into a fund to be used as follows:
    a. To compensate those likely to suffer from fuel poverty as a result of low income, poor quality accommodation, or exceptional energy needs, for example by increasing the fuel allowance or other payment, directly alongside the offer of participation in a home energy retrofit or upgrade; and
    b. To use the balance for climate actions such as energy retrofitting.
2. To return the proceeds by way of a dividend to all individuals or households ("fee and dividend" approach). Most individuals/ households would be net beneficiaries with those on lowest incomes potentially gaining the most, while all purchasers and investors would still have a price incentive towards lower-carbon options.(see section 6.6.1)

The Committee notes that the first approach provides an extra stream of revenue to finance climate action, particularly in areas such as retrofitting or public transport, and that this was the option that the Citizens' Assembly voted for. Nevertheless, the Fee and Dividend model was not put to the Citizens' Assembly as an alternative, and should be examined before a final decision is made. The Committee believes that both options should be thoroughly considered in a public

[42] According to the UK Climate Change Committee's most recent report on housing (available at: https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/), there are a number of different measures of fuel poverty in use across the UK. The most recent methodology in use is 'Low Income, High Costs'. A household is in fuel poverty if their income is below the poverty line and their energy costs are higher than is typical for their household type. The devolved administrations have retained the previous ten percent definition, which means a household is deemed to be in fuel poverty if it needs to spend more than 10% of household income on fuel.

consultation process which should include small businesses, NGO's and other relevant organisations.

The outcomes of the public consultation and the fuel poverty review should form the basis for a draft policy paper to be prepared by the Department of Communications, Climate Action and Environment jointly with the Department of Finance and Department of Public Expenditure and Reform. This draft policy paper should:

a. adopt the principles of transparency, simplicity, public acceptability, equity and effectiveness in addressing both fuel poverty and financing climate action as the criteria for the decision on how to use the hypothecated revenues;
b. outline the options for the use of hypothecated revenues and the advantages/ disadvantages of the two main approaches: (i) fee and dividend; and (ii) targeted funding for fuel poverty and climate actions;
c. outline the potential impacts on those households in fuel poverty and how best to mitigate these impacts in an efficient, transparent and equitable manner;
d. outline the potential impacts of each of the options on different social groups or regions; and
e. consider ways to mitigate impacts on low income citizens and small businesses and community enterprises/not for profit organisations that do not have ready access to low-carbon alternatives.

The Standing Committee on Climate Action should then respond to this draft policy paper and be given the opportunity to develop a consensus position on how to allocate revenues to 2030 prior to Budget 2020.

6.6.4 Carbon Price Floor

The Committee heard of the success of the UK carbon price floor in the EU Emissions Trading Scheme (ETS) and agrees with the Climate Change Advisory Council that, in the interests of consumers and to ensure a transition to renewable energy, the Government should introduce a similar price floor and work with EU colleagues to promote a co-ordinated approach across Europe. This would ensure that price fluctuations in the EU ETS do not impede or delay climate policies.[43]

6.7 Profits of fossil fuel corporations

The Committee recommends that the Department of Finance commission an enquiry into the revenue that could be realised through the introduction of a carbon tax on the profits of corporations and firms directly linked to the production and sale of gas, oil, coal and other fossil fuels. That enquiry should also look at the revenue that could be realised from the imposition of a carbon tax on the profits of other corporations and firms linked to high usage of fossil fuels including aviation, shipping etc.

[43] Further information from CCAC, n.d. *Background document: a carbon price floor for the EU ETS* [online]. Available at: http://www.climatecouncil.ie/media/EU%20ETS%20Background%20Document%2014.06.2016.pdf [accessed on 14.03.2019]

6.8 Priority recommendations of the Committee

The Committee recommends a suite of measures to incentivise climate action by citizens, businesses, and the State. Specifically it recommends:

1. All large planned and new public infrastructure projects should be priced for their climate impact using the revised shadow price of carbon. This should include:
    a) An appraisal of the climate mitigation impact of all planned and new public infrastructure projects as part of the cost benefit analysis that is necessary for Government approval; and
    b) An assessment of the climate mitigation impact and potential of Project Ireland 2040 should be completed by the Delivery Board for the National Development Plan and reported to the Climate Action Council and to the Standing Committee on Climate Action. (Sections 6.3 and 6.4)

2. That the Government undertakes a thorough review of the current financial support mechanisms for citizen engagement in the climate transition. This review must consider those citizens who can reasonably be expected to co-pay or repay (partially or in full), and those who should be fully supported. The review should consider both the efficacy and possibility to extend existing grant schemes, and the possibility of various models of innovative State-backed low-interest long-term loan schemes as employed elsewhere in Europe. This review should be completed by Budget 2020 such that the improved range of opportunities for citizen engagement be made available in tandem with planned increases in the carbon price (Section 6.5).

3. In response to the Citizens' Assembly recommendation that the level of carbon taxation should be increased, the Committee -

    - Acknowledges the expert advice in favour of this measure from the Climate Change Advisory Council and the ESRI.
    - Strongly supports the Citizens' Assembly emphasis on protecting those on low incomes.
    - Recognises that the introduction of increases in carbon pricing will have differing, and potentially negative impacts, on certain sections of society without the initial implementation of commensurate protective measures.
    - Accepts international consensus on the significant role of carbon taxation in supporting the needed behavioural and investment change away from fossil fuels and to this end, acknowledges that a carbon price trajectory to €80/t by 2030 would play an important role in the State's response to climate change.
    - Emphasises that carbon pricing should not be viewed as a solitary solution, but rather a component of a comprehensive package in which Government takes the lead on cutting emissions and making less polluting choices affordable and accessible for citizens.
    - Agrees that the proceeds from carbon pricing should be ring-fenced in legislation to ensure this does not go into general Exchequer funding.

In view of the above:

That the Minister for Finance should set out a carbon price trajectory that rises to €80 per tonne by 2030, and this should only be implemented when an evidenced-based plan is in place to increase supports and incentives for climate action measures, including the protection of those vulnerable to fuel poverty.

The Government should, prior to the introduction of any increase in carbon taxation, examine the impacts on low-income families and on the basis of these findings, introduce specific policy measures to assist those who may not be in a position to immediately transition from fossil fuels, including the potential use of social protection mechanisms, such as tax credits and welfare payments.

Starting immediately upon publication of this report -

a) The Government should conduct a review to be completed by June 2019 into the most appropriate measure of, and the extent and nature of fuel poverty across all cohorts and to include in this review the short, medium and long-term impact on fuel poverty of the options for increasing the carbon tax.

b) The Department of Finance and DPER should initiate a public consultation with citizens, communities and relevant sectors including small businesses, NGOs and other relevant organisations to invite views on the optimal way to fairly allocate the hypothecated revenue from the proposed increase in carbon tax (see section 6.6.3).

This consultation should cover the use of revenue for:

i. protection of those in fuel poverty and for specific climate actions; and/or

ii. a 'Fee and Dividend' approach.

It should also invite views on ways to mitigate impacts on low income households, small businesses and community enterprises/not for profit organisations that do not have ready access to low-carbon alternatives. The Climate Action Council should contribute to this consultation, by drawing on relevant national expertise and engagement with similar bodies in other jurisdictions. This consultation should start as soon as possible, and within six weeks of the publication of this report.

The outcomes of the public consultation and the fuel poverty review, should form the basis for a draft policy paper to be prepared by the DCCAE jointly with the Department of Finance and DPER and submitted before the end of July 2019 to the Standing Committee on Climate Action. This draft policy paper should address the findings of the fuel poverty review at (a) and the consultation at (b).

The Standing Committee on Climate Action should then respond to this policy paper and be given the opportunity to develop a consensus position on how to allocate revenues to 2030 prior to Budget 2020. (Section 6.6)

4. The Committee recommends that the Department of Finance commission an enquiry into the revenue that could be realised through the introduction of a carbon tax on the profits of corporations and firms directly linked to the production and sale of gas, oil, coal and other

fossil fuels. That enquiry should also look at the revenue that could be realised from the imposition of a carbon tax on the profits of other corporations and firms linked to high usage of fossil fuels including aviation, shipping etc. (Section 6.7)

Chapter 7: Energy

7.1 Introduction

A transformation of Ireland's energy system will be required if we are to meet our GHG emissions targets. Solutions require the large-scale adoption of clean and reliable energy at low cost, together with a dramatic increase in energy efficiency. Ireland is not on track to meet its European energy and climate 2020 targets (see Appendix 6, *Background to international and national climate change* for further detail). To reach net zero emissions by 2050, we must fully decarbonise electricity generation which is key, in turn, to the decarbonisation of other sectors, particularly heating and transport. Most of Ireland's energy needs (80%) are associated with heating and transport while 20% are delivered in the form of electricity. For the purpose of this report, this chapter deals primarily with electricity generation, while heat is addressed in Chapter 9, *Built Environment* and transport is addressed in Chapter 10, *Transport*. There is a long way to go to reduce the State's dependence on imported energy, the vast bulk of which is in the form of fossil fuels (oil, gas and coal). While the Corrib gas field greatly enhances Ireland's short-term security of supply, post 2020 Ireland is likely to remain largely dependent on imported natural gas unless we transition to renewables as quickly as possible. A sustainable energy policy is one that radically curtails our use of fossil fuels between now and 2050, as recognised in the Governments 2015 White Paper, *Ireland's Transition to a Low Carbon Energy Future 2015-2030* and the State should play its part in both reducing emissions and reducing the demand for and supply of fossil fuels in the longer term.

Ireland has significant and unexploited potential in renewable electricity generation, particularly offshore wind. A medium-term transition to a 100% renewable electricity system is necessary in order to achieve the 2050 objectives outlined in Chapter 1, *The need for a new national framework* (Section 1.3). It will require additional electricity to be generated and distributed more efficiently through flexible interconnections with Europe. The Committee appreciates that further large-scale roll out of onshore wind may not be easy to accomplish. Greater levels of local engagement, clearer benefits to communities and tighter planning regulations will be required to harness the potential of onshore wind with community acceptance. Only with a wide portfolio of different energy sources and types, in tandem with significant increases in energy efficiency, storage, and interconnections with the pan-European grid will Ireland displace fossil fuels for electricity generation.

7.2 Citizens' Assembly Recommendations

The Citizens' Assembly made three specific recommendations directly in regard to the energy sector. These recommendations were:

R5: 99% of the Members recommended that the State should enable, through legislation, the selling back into the grid of electricity from micro-generation by private citizens (for example energy from solar panels or wind turbines on people's homes or land) at a price which is at least equivalent to the wholesale price.

R6: 100% of the Members recommended that the State should act to ensure the greatest possible levels of community ownership in all future renewable energy projects by encouraging communities to develop their own projects and by requiring that developer-led projects make share offers to communities to encourage greater local involvement and ownership.

R7: 97% of the Members recommended that the State should end all subsidies for peat extraction and instead spend that money on peat bog restoration and making proper provision for the protection of the rights of the workers impacted; and (b) 61% recommended that the State should end all subsidies on a phased basis over 5 years.

The Committee has responded to Recommendations 5, 6 and 7 of the Citizens' Assembly in this Chapter. The parts of Recommendation 7 relating to peat bog restoration and protection of the rights of workers is also dealt with in Chapters 8, *Agriculture, Forestry and Peatlands* and 2, *Just Transition* respectively.

7.3 Energy efficiency as the 'First Fuel'

The Committee notes the expert contributions highlighting the importance of treating energy efficiency as a 'first fuel'. The goal of energy policy should always be to reduce energy demand as a priority. To this end, the Committee recommends that the SEAI:

i) develop its energy auditing programmes for business in 2019 with a view to offering a wider range of services to SMEs, farms and residential management companies; and

ii) develop more innovative programmes in demand management and energy storage.

While this report contains recommendations in relation to energy efficiency in buildings, the Committee did not consider other aspects of energy efficiency in depth. This is something which the Standing Committee on Climate Action should return to.

7.4 Offshore renewable energy generation

7.4.1 Offshore wind energy

Ireland's offshore wind resource is substantial. Once developed Ireland could become a net exporter of renewable electricity to the European grid. In doing so, Ireland could reap the benefits of job creation, valuable revenues and greater energy security. Recent offshore wind auctions in the UK and Europe point to rapidly decreasing capital costs such that commercially viable deployment without the need for subsidies is fast becoming a reality[44]. The Committee was repeatedly informed during evidence that the key barrier to greater deployment of offshore wind is the lack of a regulatory and legislative framework, specifically due to the delay with the *Maritime Area and Foreshore (Amendment) Bill*. Offshore wind is included in the proposed new Renewable Electricity Support Scheme (RESS) and it is important to ensure no further delays and to stimulate development and deployment in a cost effective manner.

The Committee is fully supportive of offshore wind deployment, especially as it is both much more socially acceptable and has higher capacity factor than onshore wind. The Committee

[44] Evans, S., 2017. UK auction reveals offshore wind cheaper than gas. *Carbon brief,* 11 September [online]. Available at: https://www.carbonbrief.org/analysis-uk-auction-offshore-wind-cheaper-than-new-gas [accessed on 25.03.2019]

recommends that the Government develop and publish a legislative framework for offshore wind as a matter of priority. The *Maritime Area and Foreshore (Amendment) Bill* should cover, among other things, all regulatory and licensing aspects of offshore wind. The Bill should be published before summer 2019. Grid connection, particularly on the West coast is an issue that should be looked at in parallel. The Committee heard that there are a couple of different approaches to this issue in Europe – in the UK the State has taken on licensing and de-risked the grid connection; while in the Netherlands the State has built the grid connection itself. The Committee favours the latter approach.

Seagrass offers substantial carbon sequestration benefits. Establishing seagrass farms around the offshore structures should be encouraged as part of offshore wind development.

The Department of Communications, Energy and Natural Resources published the *Offshore Renewable Energy Development Plan* in 2014 and an interim review was published in May 2018 following public consultation.[45] A full review of the plan is due in 2020. This review should be accelerated and the Department should take into account the relevant content and recommendations of this report, in particular in relation to offshore wind. As part of this the Department of Communications, Climate Action and Environment should set out the appropriate model for grid connection for offshore wind projects in Ireland, having regard to successful models in Europe. To further inform this review, the Climate Action Council should advise the Department on an appropriate and ambitious target for deployment of offshore wind capacity off our coasts for 2030.

7.4.2 Ocean energy

Ireland has one of the world's greatest wave resources and a modest tidal (current) resource. Though presently undeveloped, it has considerable potential with significant enterprise possibilities. It also presents a further diversification of the renewable energy portfolio, potentially allowing a greater share of intermittent renewables to be tolerated on the grid. As outlined in Chapter 5 *Unlocking potential*, the Committee is fully supportive of ocean (wave and tidal) development and deployment. Such untapped potential requires a programme of substantial targeted R&D investment if projects are to be progressed to commercial viability.

7.5 Onshore renewable energy generation

7.5.1 Onshore wind energy

Onshore wind energy is currently the primary source of renewable electricity in Ireland, accounting for 84% of renewable power generation in 2017. The Committee heard that the main barriers to increasing onshore wind further include public opposition, challenges in community energy projects, out-of-date Wind Energy Development Guidelines (2006) and delays with planning and grid access. Whilst onshore wind alone will not supply Ireland with sufficient electricity to become self-sufficient, it is evident that it must be used alongside other sources of renewable energy. With due regard to balancing the concerns of communities and the potential for harnessing opportunities, the Committee recommends that a revised regulatory framework be put in place, to provide for sustainable onshore wind energy development. This should include revised planning

[45] DCENR, 2018. *Offshore Renewable Energy Development Plan* [online]. Available at: https://www.dccae.gov.ie/en-ie/energy/topics/Renewable-Energy/electricity/offshore/offshore-renewable-energy-development-plan-/Pages/Offshore-Renewable-Energy-Development-Plan.aspx [accessed on 08.02.2019]

guidelines that better assess and address objections raised by impacted communities. The Department of Communications, Climate Action and Environment should commission independent research in those areas where new wind energy infrastructure has been constructed to investigate the precise grounds and concerns which have provoked resistance and take the necessary steps to address them. Insights from this research should be used to help address these concerns. The Committee also notes that there is the potential via upgrades to existing facilities, particularly older facilities, to increase substantially efficiency without the need to erect additional infrastructure. The Committee encourages the upgrade of existing onshore wind turbines where this would yield additional potential at low cost and minimal additional disruption to communities. The Committee notes that there are alternative ownership models consistent with EU competition regulations. The Citizens' Assembly heard evidence about Denmark and Scotland who have a legal requirement for developers to share ownership and benefits with the local community. These benefits may come in the form of free electricity provision and/or a share in proceeds that benefit both individuals and community facilities such as schools, clubhouses or resource centres. The legal framework to enable community benefits is already provided in EU directives. The Committee recommends that the Government prioritise the transposition and implementation of recent EU directives (the revised Renewable Energy Directive which is accompanied by the Energy Efficiency Directive. The Department of Communications, Climate Action and Environment should also engage with the Standing Committee on Climate Action on the detailed design of the RESS auctions before it is finalised, to ensure that community benefits and investment are both mandatory for all new large-scale developments and consistent with practices in other European jurisdictions. The Department should put measures in place to ensure that 'community ownership' benefits all members of communities in equal measure and not just those in a financial position to engage with renewable energy projects.

State companies such as Bord na Móna and Coillte have ownership of large land areas that may prove suitable for the development of new onshore wind farms, subject to ensuring appropriate siting which includes avoiding the further disturbance of peatlands. They should be encouraged to lead investment into the production of onshore wind. The future development of such sites could be considered as part of a Just Transition and investigation into the future development of these companies (Chapter 2, *Just Transition*).

7.5.2 Solar power

The use of solar energy, in the form of solar water heaters or solar PV panels, alongside wind, helps to equalise renewable energy availability across seasons and weather conditions. The Committee heard that for several reasons, which include planning and grid restrictions, solar energy is seriously under–exploited in Ireland. This is in stark contrast to many European countries where, in addition to commercial scale installations, citizens or community renewable co-operatives use it themselves, sell it to the grid and exchange it.

The SEAI offers grants for domestic solar PV installations. However, one of the concerns raised with the Committee was that, under 2007 Planning Guidelines, the number of solar PV panels permitted without planning permission was restrictive so that, for example, the electricity generated was not enough to provide for the energy needs of the house. This should be addressed as a matter of priority so as to enable increased microgeneration capacity in homes, farms and businesses without the need for planning permission. Commercial-scale deployment of solar PV is

also difficult at present. The grant scheme is only for owner-occupied dwellings, not commercial rooftops. Although warehouses and factories can be very large, rooftop solar projects are generally too small in scale to cope with the bureaucracy of the auction and grid connection system in the recently released RESS.[46]

It has also been suggested that Ireland should have more solar farms and that such developments will require proper planning guidance to be locally acceptable. Currently they are just subject to the statutory requirements of ordinary planning legislation. New guidance will very likely be required to enable their deployment at the scale required.

As with onshore wind, the substantial land banks of Coillte and Bord na Móna have the potential to house large scale solar PV electricity generation. Coillte and Bord na Móna should review their land banks with regards to their potential for use as wind and/or solar farms.

7.5.3 Microgeneration

The ability of householders, farmers and small enterprises including community groups to generate their own energy (primarily from solar PV but not necessarily exclusively so) and sell surplus electricity back to the grid has been a key factor in the renewable energy revolution in other countries, notably Germany. By 2021, as one of the requirements under the European Clean Energy Package, Ireland must legislate for a re-configuration of the electricity market to make it possible for community-scale projects and private micro-generation "prosumers" (both a producer and consumer of electricity) to be able to sell any surplus electricity back into the grid.[47] Smart metering will be key to a successful microgeneration scheme, and the Committee recommends the speedy rollout of the Commission for Regulation of Utilities (CRU) smart metering programme so that all utility customers can avail of all energy services by the end 2020.

The Committee was informed that the development of battery technology, alongside the use of EV's to store surplus electricity, should further facilitate microgeneration as it will enable excess energy to be saved within the home for periods when generating capacity is low. A fleet of vehicles or chargers can act as a demand response resource, shifting load in response to price signals or operational needs. For example, vehicle charging could be moved to the middle of the day to absorb high levels of solar generation and shifted away from evening hours when solar generation disappears and the electric demand in the system peaks.

While the surpluses generated by microgeneration are likely to be quite small between now and 2030, the Committee supports having an appropriate tariff set which would reward householders and enterprises for supplying electricity to the grid. This should be set to at least the wholesale point price. The level of payment for microgeneration should be carefully examined as not everyone is able to be a prosumer (e.g. if they live in an apartment with no roof space to mount solar PV panels). As well as this, citizens will only benefit from microgeneration if they can afford to purchase and install renewable energy technologies such as solar panels. It is important that

[46] Breaking news, 2018. *New scheme encouraging homeowners to install solar panels launched today.* 31 July. [online]. Available at: https://www.breakingnews.ie/ireland/new-scheme-encouraging-homeowners-to-install-solar-panels-launched-today-859024.html [accessed on 22.03.2019]

[47] Committee hearing with the Department of Communications, Climate Action and Environment on 26 September 2018. Transcript available at: https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_climate_action/2018-09-26/debate/mul@/main.pdf [accessed on 07.03.2019] page 18

vulnerable groups are not excluded from the energy transition. Breaking down barriers to exclusion could include, for example, all or a combination of additional grants for community schemes in isolated or socially disadvantaged areas, special assistance for lower income households and access to State-backed low-interest long-term loans (Chapter 6, *Incentivising Climate Action*).

7.5.4 Community energy

There is huge unmet potential for community energy initiatives [48] to deliver both energy conservation and renewable energy generation, the two key elements of meeting our energy targets. Community owned energy can help to overcome some of the obstacles to renewables by allowing citizens to participate in the transition to clean energy in a way that delivers local social and economic benefits. It can help to meet anticipated strong growth in energy demand over the period to 2030. The high-level design for the RESS highlights specific requirements for community involvement in projects supported via the scheme. However the committee heard about how energy communities are struggling, and require resources and core funding from Government. There is no national target for community owned energy and many practical barriers to community energy exist, barriers which can be removed through policy changes.

Specifically,

1. Core funding is lacking and needs to be addressed. Reliable, multi-annual sources of core funding for administrative costs and for staffing of community energy groups is essential for groups to expand and to function effectively.

2. Mentoring in community development is currently lacking and should be provided as essential complements to technical and financial support. There is an urgent need for the provision of trusted intermediaries who can provide funding, finance and information supports for initial stages of development and support with planning and construction.

3. Support measures are needed to realise the opportunities offered from locally generated solar power, particularly on roofs of schools and sports clubs all over Ireland. This requires a mechanism for payments for surplus power or for small scale private or community solar generation. Mandating a payment for electricity from solar generation is key to unlocking a new era of progress on renewables.

The Committee also heard of the need to allocate greater resources for intermediary actors for community energy initiatives across Ireland [49] , based on the highly successful model of the Tipperary Energy Agency. The intermediaries can enable the transition to community owned energy and to assist in the effective roll out of domestic and community retrofit. Significant Exchequer funding must be provided for intermediary actors to offer guidance and support in addition to specific allocation for start-up funds for communities.

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[48] Examples of community owned energy include a wind farms and solar farms owned by a community; a collection of solar arrays across a number of community buildings, homes and farm sheds; anaerobic digestion systems fed from local farm waste; small hydro plants; and collective insulation or energy retrofit projects.

[49] As noted by MaREI witness to the Committee on 12 December 2018. Debate available at: https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_climate_action/2018-12-12/debate/mul@/main.pdf [accessed on 25.03.2019]

The Committee was told of the intent to support the development of 500 SECs (there are 200 currently) and in that regard it recommends that the Government apply a suite of resources that will ensure that these community energy groups develop to their full potential. There should also be an ambitious national target set by the Climate Action Council for installed SEC capacity by 2025 which may be at least 500MW.

7.6 The Electricity grid and policy

7.6.1 Integration of renewables onto the grid

Eirgrid is Ireland's electricity Transmission System Operator (TSO) and is recognised as an international leader in integrating intermittent renewable energy onto the grid. As a result, Eirgrid can now integrate up to 65% renewable capacity onto the grid with a goal to increase renewables penetration to at least 75% of peak demand by end of 2020. In addition, a recent study[50] analysed the cost effectiveness and technical feasibility of a 70% renewable share of electricity production by 2030, which this Committee endorses (Chapter 1,*The need for a new national framework*). A shift to 70% renewable electricity by 2030 is feasible, but will require an ambitious and holistic energy policy to be implemented as a matter of urgency. According to the 2018 Baringa study, this target will require a significant increase in onshore and offshore wind to around 10,000 MW of installed capacity, nearly 3,000 MW of solar generation, a strengthened transmission system, more interconnection capacity and the electrification of heating and transport systems.

This would position Ireland among those countries spearheading the integration of renewables onto the grid, especially considering that Ireland presently has an isolated grid. The Committee commends Eirgrid on their continued work and expertise in this area, whilst also recognising that both Eirgrid and ESB Networks must prepare and invest in the electricity grid for greater deployment of heat pumps, electric vehicles and the expansion of microgeneration, as well as the further expansion of the European interconnector system.

7.6.2 The Renewable Electricity Support Scheme (RESS)

In July 2018, the Department of Communications, Climate Action and Environment published the High Level Design for the latest Renewable Electricity Support Scheme (RESS) which will provide support for renewable electricity projects in Ireland through a series of scheduled, competitive auctions. The RESS currently aims for renewables to make up 55% of our electricity generation by 2030[51] but this will now need to be revised to be more ambitious in line with the recommendations from this Committee on the matter which aims for a 70% target on that timescale (Chapter 1, *The need for a new national framework*)

[50] Baringa, 2018. *A 70% renewable electricity vision in Ireland by 2030* [online]. Available at: https://www.iwea.com/images/files/70by30-report-final.pdf [accessed on 07.03.2019]
[51] DCCAE, n.d. *RESS* [online]. Available at: https://www.dccae.gov.ie/en-ie/energy/topics/Renewable-Energy/electricity/renewable-electricity-supports/ress/Pages/default.aspx [accessed on 21.03.2019]

The High Level Design is being translated into a detailed design of the RESS auctions. The first auction starting this year, 2019 is, directed at "shovel ready" projects aimed at reducing the gap to Ireland's 2020 renewable electricity targets.[52]

Key policy objectives under the new RESS include:

- A community participation framework;
- Technology diversity (in scale of development and technologies used). The new RESS will provide opportunities for solar PV, wind (onshore and offshore) and bioenergy;
- Delivering an ambitious renewable electricity policy to 2030; and
- Increasing energy security, energy sustainability and providing a cost effective energy policy.

The Committee understands that under RESS, there will be a portion of capacity ring-fenced in the second auction (expected to be held in 2020) for community led renewable energy projects, and that the enabling framework for communities under RESS will consider options in relation to shared ownership, community-led projects, revenue sharing models and community benefit funds. It is important that the community ownership, partnership and benefits set out in RESS be communicated to citizens in locations suitable for renewable energy projects (note that the Citizens' Assembly recommendations were made prior to the publication of the proposed new RESS). The measures in RESS and any additional measures put forward must ensure that benefits from renewable energy developments are distributed equitably across all members of the relevant communities. The Committee recommends that the Department of Communications, Climate Action and Environment provides for support to a limited number of community-led pilot projects in the first round of the RESS scheme.

7.6.3 Grid connection policy

The Commission for Regulation of Utilities (CRU) is responsible for, among other things, setting the electricity grid connection policy. Delays to grid access have been an issue for large-scale renewable energy projects for some time and the grid connection policy is no longer fit for purpose.

Access to the national grid is currently very challenging and can be resolved with regulatory changes within the CRU. It is important to remove the barriers to grid connection that will be faced by microgeneration (i.e. approx. 11- 100 kw) and community led renewable generation projects (i.e. approx. 500 kw - 5 MW). The Committee heard that the CRU is responding to this by changing their approach and is in the process of delivering an Enduring Connection Policy (ECP).[53] The CRU published its ECP-1 decision in March 2018. The finalised ECP-1 offers are being issued at this stage and ECP-2 is currently being designed. The CRU should report to the Standing Committee on Climate Action annually on whether their changed approach to grid connection policy is successful in alleviating delays to grid access.

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[52] DCCAE, 2018. *Minister Denis Naughten secures Cabinet Approval for Renewable Electricity Support Scheme (RESS)* [online]. Available at: https://www.dccae.gov.ie/en-ie/news-and-media/press-releases/Pages/Minister-enis-Naughten-secures-Cabinet-Approval-for-.aspx [accessed on 07.03.2019]

[53] Committee hearing with the CRU, 19 December 2018. Transcripts available at: https://www.oireachtas.ie/en/debates/debate/joint_committee_on_climate_action/2018-12-19/2/ [accessed on 07.03.2019]

7.6.4 Electricity interconnections to the European grid

Greater electricity interconnection is important for our future energy security and also, with the increasing levels of intermittent renewables on the grid, for Ireland to have a continuous reliable source of electricity and to enable us to export all excess capacity energy as we ratchet up the renewable energy we produce. It is unlikely that the European target of 15% interconnectivity will be met by 2030 and as it stands all of our interconnection is with the UK, which most likely will no longer be a part of the EU. The proposed Celtic Interconnector, currently at feasibility stage, between East Cork and France is expected to be operational by 2025-2026. It will have a capacity of 700MW which is unlikely to satisfy the 15% target. The IIEA states that, "The *National Policy Statement on Electricity Interconnection* is an important starting point for a more detailed post-Brexit interconnection strategy."[54]

The Committee was advised on a number of occasions that enhanced electricity interconnection to both the UK and Europe is needed. The Department of Communications, Climate Action and Environment also made reference to the possibility of an Ireland to Wales interconnector. The Committee fully supports greater interconnection and a more detailed post-Brexit interconnection strategy along with a full review on interconnectivity capacity which will be essential if Ireland is to exploit offshore wind, and move towards a 100% renewable energy system. As a part of its work, the Standing Committee on Climate Action should also look into the various aspects of having interconnectors in State ownership.

7.7 The role of carbon-based fuels in energy generation

7.7.1 Peat and coal use

The desire of the Committee is that energy generation through the use of coal and peat should cease as soon as it is technically feasible and that the relevant targets in the NDP should be re- examined. The Committee notes, that the early closure of Moneypoint risks creating a potential shortfall of dispatchable generation capacity. Replacing this capacity with new fossil fuel generation on the other hand would risk locking in that new plant or creating stranded assets. The Committee believes that in order to get to net zero emissions in electricity as a whole by 2050, the emissions intensity of electricity generation must follow a downward trajectory. The Committee also notes the recent temporary closure of Moneypoint and recommends that the ESB (and Eirgrid if appropriate) be invited to present to the Committee and, in the interim, make available information on how the challenge of balancing the grid during this period without Moneypoint was overcome and what policy lessons can be derived from that experience. The Committee recommends that the active use of Moneypoint be kept to a minimum and looks forward to examining the future proposals for the site that are now under consideration by the ESB. The Committee is also cognisant of the impact on those whose livelihoods are dependent on Moneypoint (see Chapter 2, *Just Transition*). Engagement with those whose employment will be affected by the closure of Moneypoint should commence at least three years prior to any proposed closure date. In that regard, any decision to close Moneypoint, the Government should guarantee to underwrite the current pay, conditions and

[54] Muenchmeyer, M., 2018. *Ireland's Energy and Climate Plan: Consolidation, Cohesion, Consultation* [online]. Available at: https://www.iiea.com/publication/irelands-energy-and-climate-plan-consolidation-cohesion-consultation/ [accessed on 25.03.2019]

pensions rights of workers affected where those workers continue to be employed in State renewable energy industries. This provision should also apply to Bord na Móna workers impacted by the cessation of peat extraction.

The Committee notes the Citizens' Assembly recommendation that subsidies for peat extraction should cease by 2022. The Committee agrees that using peat for electricity generation should be stopped at the earliest opportunity including the current practice of co-firing peat with biomass, consistent with the planned Just Transition for the Midlands (Chapter 2, *Just Transition*).

The Department of Communications, Climate Action and Environment, in conjunction with the ESB, Eirgrid and Bord na Móna, should continuously examine the options available to the State in the phasing out of coal and peat burning for electricity generation followed by other non-renewable carbon fuel sources. This will depend upon our national renewable energy capacity, changing demands for electricity, which may increase with EVs, heat pumps, data centres etc., and the status of interconnection to both the UK and mainland Europe. Progress should be reported quarterly to the Standing Committee on Climate Action.

7.7.2 Bioenergy

The Department of Communication, Energy and Natural Resources published a draft Bioenergy Plan in 2014 which recognises the importance of an indigenous bioenergy industry to the expansion of renewable energy, jobs and the economy.[55] This plan continues to be used in its draft state and requires a Strategic Environmental Assessment (SEA).[56] It is important that this SEA is carried out as soon as possible and that further development of the bioenergy sector also take account of, among other things, biomass sustainability and the proper management of our woodlands. Bioenergy can play a role in mitigating climate change by replacing fossil fuels, particularly in sectors where electricity produced by renewable sources such as wind and solar is difficult.

Biogas is an indigenous energy source that can reduce our emissions, can be sustainable under strict environmental conditions, and could create much-needed jobs in rural Ireland. It is discussed in further detail in Chapter 8, *Agriculture, Forestry and Peatlands*.

Sustainably sourced indigenous biomass also has the potential to deliver significant, cost-effective carbon savings, and should be supported (Chapter 8, *Agriculture, Forestry and Peatlands*). Commercial forestry operations including Coillte are offering long-term supply contracts to businesses in manufacturing, pharmaceutical, food and hospitality sectors, but this emerging market must be closely supervised to ensure strict forestry standards and that real sequestration and mitigation is taking place. As the Committee saw in Tipperary, an effective use of biomass is in district heating or as a replacement for imported fuel.

Like biogas, biomass could replace some of the fossil fuel on which we currently rely and is already in use in the Bord na Móna Edenderry plant. However, in that instance the use of imported palm oil husks have been the key crop component and this is not a sustainable solution. The extent of the role for sustainable biomass in electricity generation should be determined as part of

[55] DCENR, 2014. *Draft bioenergy plan* [online]. Available at: https://www.dccae.gov.ie/en-ie/energy/topics/Renewable-Energy/bio-energy/Pages/Bio-Energy.aspx [accessed on 08.02.2019]
[56] Further information on SEA is available from the EPA, here

a national review of land use. The need for such a review is further outlined in Chapter 8, *Agriculture, Forestry and Peatlands*.

Importantly, the Committee heard that assumptions should not be made that biomass is always carbon neutral. Full accounting for bioenergy should include fossil fuel substitution, carbon debt, indirect land use change, foregone carbon sequestration, displacement of other uses of biomass and potentially negative consequences for biodiversity, water quality and food security.

7.7.3 The potential role of Carbon Capture and Storage

Carbon Capture and Storage (CCS) remains under development at present and is not, as yet, commercially viable. However, future viability of the technology is assumed in almost all scenarios consistent with keeping warming globally to below 1.5°C above pre-industrial levels. The IPCC in its recent Special Report (SR 1.5) concludes:

> *All pathways that limit global warming to 1.5°C with limited or no overshoot project the use of carbon dioxide removal (CDR) on the order of 100–1000 GtCO2 over the 21st century. CDR would be used to compensate for residual emissions and, in most cases, achieve net negative emissions to return global warming to 1.5°C following a peak (high confidence). CDR deployment of several hundreds of GtCO2 is subject to multiple feasibility and sustainability constraints (high confidence). Significant near-term emissions reductions and measures to lower energy and land demand can limit CDR deployment to a few hundred GtCO2 without reliance on bioenergy with carbon capture and storage (BECCS) (high confidence). {2.3, 2.4, 3.6.2, 4.3, 5.4}*

The Committee heard that in the UK the Government has developed a strategy on its use. Development of CCS approaches remains an ongoing area of research in several jurisdictions. The Committee is of the view that the prospect of CCS should not be seen as an excuse not to press ahead with deployment of onshore and offshore renewables and efforts at increasing energy efficiency. However, given the recognised need for CCS in all scenarios considered by IPCC that keep warming below 1.5°C, the Committee recommends that the Government, Climate Action Council and the Standing Committee on Climate Action periodically review the matter of viability and desirability of CCS adoption.

7.8 Energy storage

The storage of electricity through the use of batteries, pumped storage or compressed air storage (amongst others) will be of vital importance both in terms of security of supply and in the switch-over to renewable energy sources. However, this is not something which the Committee discussed in any detail and should be a priority subject of further consideration by the Standing Committee on Climate Action. The Government should also ensure energy storage technology will be included under the RESS, to promote acceleration of its use in Ireland. EirGrid should develop a comprehensive energy storage plan as Ireland increases the penetration of renewables into the grid.

7.9 Priority recommendations of the Committee

The Committee recommends the following:

1. Rapid development and deployment of offshore wind energy is critical if we are to meet our international emissions reduction obligations. To this end, the Government should:
    a. Bring forward the *Maritime Area and Foreshore (Amendment) Bill* with a view to its enactment by the end of 2019 ensuring that the development of offshore wind is prioritised;
    b. In parallel, the Department of Communications Climate Action and Environment should carry out a full review of the *Offshore Renewable Energy Development Plan* by January 2020; and
    c. To inform this review, the Climate Action Council should advise the Department on an appropriate and ambitious target for deployment of offshore wind capacity by 2030 consistent with national emissions targets. (Section 7.4.1)

2. The Government should prioritise the transposition and implementation of recent EU directives (the revised Renewable Energy Directive which is accompanied by the Energy Efficiency Directive) that will require broader scale adoption of renewables including onshore wind and solar. It is important to do so in a socially acceptable manner, and in particular by removing barriers that are impeding its development. The Committee specifically recommends that:
    a. No later than 1 September 2019, the Department of Housing, Planning and Local Government update and publish new Wind Energy Development Guidelines,
    b. Prepare guidelines if necessary for large scale solar energy farms;
    c. The Department of Communications, Climate Action and Environment should commission independent research in those areas where new wind energy infrastructure has been constructed to investigate the precise grounds and concerns which have provoked resistance and take the necessary steps to address them; and
    d. The Department of Communications, Climate Action and Environment should engage with the Standing Committee on Climate Action on the detailed design of the RESS auctions before it is finalised, to ensure that community benefits and investment are both mandatory for all new large-scale developments and consistent with practices in other European jurisdictions. The Department should put measures in place to ensure that 'community ownership' benefits all members of communities in equal measure and not just those in a financial position to engage with renewable energy projects. (Sections 7.5.1, 7.5.2, 7.6.2)

3. For community energy and small-scale renewable generation:
    i) A review of the electricity market rules should be undertaken by the end of 2019 by the Department of Communication, Climate Action and Environment in conjunction with the CRU in order to enable micro-generated electricity to be sold to the grid. This should include provision for a feed-in tariff for microgeneration to be set at least at the wholesale point price. The CRU should accelerate the national rollout of the smart metering programme to enable this and remove the barriers to grid connection that will

be faced by microgeneration (i.e. approx. 11- 100 kw) and community led renewable generation projects (i.e. approx. 500 kw - 5 MW).

ii) The Department of Housing, Planning and Local Government urgently amend planning regulations to remove planning restrictions on solar PV panels so as to enable increased microgeneration capacity at household, farm and small enterprise levels without planning permission. Revised regulations should be in place no later than March 2020.

iii) To support Sustainable Energy Communities (SECs), the Government should put in place the following measures in 2019:
   a. Provision of a suite of specific funding and expert support measures to SECs to enable them to build on the excellent work that has been done to date;
   b. oversee the development of an Energy Master Plan for the SECs; and
   c. identify opportunities for specific projects to be undertaken that may be eligible for Government grant aid.

   The SECs should be provided appropriate levels of support from the Department of Communications, Climate Action and Environment, SEAI, the Climate Action Regional Offices, and their local authority. There should be an ambitious national target set by the Climate Action Council for installed SEC capacity by 2025 which may be at least 500MW.

iv) The Department of Communications, Climate Action and Environment should provide support to a limited number of community-led pilot renewable energy projects in 2019, if possible, through a ring fenced community pot in the first RESS auction, and through the Climate Action Fund. (Sections 7.5.3, 7.5.4, 7.6.2)

4. The Department of Communications, Climate Action and Environment, in conjunction with the ESB, Eirgrid and Bord na Móna, should continuously examine the options available to the State to phase out coal and peat burning for electricity generation. The Department should also report quarterly to the Standing Committee. In addition, and in the interests of a Just Transition, any decision to close Moneypoint and when peat extraction has ceased, the Government will guarantee to underwrite the current pay, conditions and pensions rights of workers affected where those workers continue to be employed in State renewable energy industries. (Section 7.7.1)

5. On bioenergy, the Committee recommends that:

   a. The Government re-evaluate its co-firing subsidy for peat and biomass given environmental concerns identified by the Climate Change Advisory Council;

   b. Bord na Móna and the ESB re-evaluate their future plans for biomass due to the lack of an indigenous supply and the outcomes should be reported to the Standing Committee on Climate Action by the end of 2019; and

   c. The Department of Communications, Climate Action and Environment should finalise the Strategic Environmental Assessment of the draft National Bioenergy Plan by the end of Q2 2019. (Section 7.7.2)

Chapter 8: Agriculture, Forestry and Peatlands

8.1 Introduction

The agri-food sector is Ireland's largest indigenous industry, producing high quality food and drinks that are recognised worldwide. Reducing emissions from agriculture is a global challenge requiring both global and local solutions. Ireland has a large agricultural sector relative to the overall economy with agricultural emissions accounting for a disproportionately large portion (32.3%) of our total national emissions, which is projected to increase. There is therefore an urgent need to reduce GHG emissions in agriculture while simultaneously improving farm incomes to ensure the delivery of sustainable livelihoods across Ireland and a healthy natural environment. A thriving agricultural sector is not fundamentally at odds with effective climate mitigation outcomes, with efficient and sustainable agricultural production playing a key role in a low carbon society.

The role of the State must be to encourage innovation and diversity in the sector and ensure that policies and incentives are aligned with, rather than contrary to, meeting the climate change goals of the State. Farmers and landowners, as custodians of the land, and as those who may be impacted most severely by climate change, have an intimate knowledge of and actively manage the land and will drive solutions forward.

Climate change is already having adverse impacts on Irish agriculture, altering the use of land and changing the timing of natural events. The negative impacts for soils, water, biodiversity, vegetation and wildlife are likely to be significant. Recent fodder crises and extreme weather events are evidence of the severe pressures being placed on the sector.

Emissions from soils due to agriculture, forestry, peatland drainage and peat extraction are a major element of Irish emissions. Conversely, the restoration of soils to carbon sequestering status can both prevent these emissions and (more slowly) start to reabsorb carbon. Similarly, appropriate afforestation, forest management and use of forest products can lead to carbon sequestration and storage. Effective policies to store and sequester carbon can offer substantial co-benefits for tourism, biodiversity, water quality and management, and for climate resilience.

8.2 Recommendations of the Citizens' Assembly

The Assembly made three recommendations and one ancillary recommendation in relation to agriculture and land use, namely:

R11: 89% of the Members recommended that there should be a tax on 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.

R12: 93% of the Members recommended that the State should introduce a standard form of mandatory measurement and reporting of food waste at every level of the food distribution and supply chain, with the objective of reducing food waste in the future.

R13: 99% of the Members recommended that the State should review and revise supports for land use diversification with attention to supports for planting forests and encouraging organic farming (R.13).

AR3: The agriculture sector in Ireland requires ongoing support to make a transition towards models of production which give rise to lower GHG emissions. Cognisance must be taken of the impact which the sector has on the economy, particularly the rural economy.

The Committee heard from many experts with regard to agricultural and land-use policy but spent little time on the issue of food waste. Hence substantive responses are given below to three of the four recommendations.

8.3 Current position of the agriculture sector

The agri-food sector, as Ireland's largest indigenous industry, remains the largest emitter of GHGs. The Committee recognises that Ireland cannot meet its international emissions targets without tackling agricultural emissions. Emissions from agriculture and land-use are currently on an increasing trajectory.[57] There has been a 31% increase in milk production from 2012-16, which has been the main driver in an 8% increase in emissions, the carbon efficiency per head of cattle has thus increased. 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.[58]

Over the past 50 years Irish agriculture has become increasingly specialised in beef and dairy farming, which has the highest climate impact via methane emissions.[59] This specialisation has been in tandem with major growth in demand for beef and dairy products. However the Committee also heard that the global shift to meat and dairy as high-carbon foodstuffs will have to be reversed to tackle climate change. Unfortunately, because of disjointed policies and market failures (in particular the power of large retailers), farmers are not fully or adequately rewarded for current production. For the beef sector in particular, farmers are not getting paid enough for their quality product. Such specialisation places the sector in a potentially exposed position vis-à-vis potential for impacts of new disease outbreaks, global market vagaries, and long-term changes in consumer dietary behaviours. Specialisation has been accompanied by reductions in biodiversity, water quality and soil fertility. Also as a direct result of this specialisation, production of horticultural produce has reduced leading to increased reliance upon imports. There are currently ambitious targets aimed at adding value in the sector under FoodWise 2025. Exports are expected to reach €19 billion, which without diversification of the sector will inevitably drive higher levels of ruminant-based production and place GHG emissions on a continued upward trajectory, even with improved efficiency gains. There is a need for a more diversified, resilient, sustainable and equitable model

[57] According to Teagasc, agriculture emissions increased by 2.7% in 2016 relative to 2015 and by 2.9% in 2017, due to higher dairy cow numbers and a related increase in progeny from the dairy cow herd.

[58] The EU Joint Research Centre ranks Ireland as the most carbon efficient dairy producer and 5th most carbon efficient beef producer in Europe (https://ec.europa.eu/agriculture/sites/agriculture/files/external-studies/2010/livestock-gas/full_text_en.pdf). However, a later FAO report which uses a different methodology that considers the whole product lifecycle ranks Ireland considerably more poorly. Further information from Bellows, R. 2019. Farming's great growth dilemma - Can farmers maintain growth while delivering on climate action obligations? *The Irish Independent*. 13 February [online]. Available at: https://www.independent.ie/business/farming/forestry-enviro/environment/farmings-great-growth-dilemma-can-farmers-maintain-growth-while-delivering-on-climate-action-obligations-37805330.html and the FAO Global Livestock Environmental Assessment Model (GLEAM) http://www.fao.org/gleam/results/en/ [both accessed on 14.03.2019]

[59] Methane is a greenhouse gas with a comparatively short atmospheric lifetime compared to carbon dioxide but a much higher warming effect. One tonne of methane emitted into the atmosphere in 2019 will be largely removed by 2039. However, during that interval, it will have been responsible for trapping 86 times more heat than a tonne of carbon dioxide emitted at the same time

for Irish agriculture. This must now form the central component of a long term strategy development for Irish agriculture moving forward.

8.4 Using funding support mechanisms to lower agricultural sector GHG emissions

8.4.1 Common Agriculture Policy (CAP) reform

The next round of the Common Agricultural Policy (CAP) will see an increase in the environmental component of payments and will permit Member States to tailor payment schemes to national circumstances. This, however, must be viewed in the context of an anticipated overall cut of 5% in CAP for the period 2021-2027 which, when adjusted for inflation, may represent a real-terms cut of up to 20%. Reforms open opportunities to direct available payments towards helping to meet national climate targets. The Committee was informed that it is envisaged that 40% of the overall CAP budget will be directed at climate and environmental measures. This will give the State substantial and additional scope, if managed strategically, to promote those farming activities that have a stronger positive climate impact. Ireland will have to draw up a national CAP that embraces both Pillar 1 (the income support system with an eco-scheme attached) and Pillar 2 (rural development policy). The Committee encourages the State to achieve the maximum potential from this payment, and all proposals should be assessed under two key criteria, namely:

1. The climate and broader environmental impact potential of the measure; and
2. The availability of science-based metrics to measure the impact.

The National CAP Implementation Plan should comprise supports for effective and proven measures for reducing GHG emissions on a farm by farm basis, delivered through results based payments to farmers. This allows each farmer the flexibility to choose the degree to which they wish to implement measures: greater implementation receiving larger payments and lower implementation receiving lower payments.

The best prospect of achieving a good outcome to the new National CAP Implementation Plan is to engage the farming community in developing proposals in a bottom-up process. The Committee was told of a participative forum on agriculture and climate emissions in France in which farm organisations, government agencies and NGOs are collectively working toward alternative models for agriculture. The Committee recommends that such a forum be established here, with the specific role of exploring and developing options and potential solutions for a Just Transition in agriculture. This can be facilitated by a multi stakeholder forum on agricultural diversification and climate change. The recommendations that arise from this process should then inform the Rural Development Plan. The process of developing measures under the new CAP should take account of current measures such as: the Green Low Carbon Agri-Environment Scheme (GLAS), the Beef Data and Genomics Programme (BDGP), the Knowledge Transfer Program and the Targeted Agricultural Modernisation Scheme (TAMS). These should be retained and expanded where they are deemed to offer value for money in the context of lowering emissions. CAP payments should also promote biodiversity, water quality and carbon storage, especially for small farmers who are often dependent on off-farm incomes and need additional options to make farming a viable option on marginal land.

8.4.2 The potential role of taxation

The Committee recognises that the desire implicit in the taxation recommendation of the Citizens' Assembly is to encourage the adoption of climate friendly agricultural practices and CAP can go some way towards doing this. The issues around taxation as a means to manage agricultural emissions are complex and were not considered by the Committee in sufficient detail. The Committee thus recommends that the Standing Committee on Climate Action should address this issue and seek to explore appropriate and effective mechanisms of GHG pricing, including through emissions trading taking into account the various challenges associated with applying a carbon price in this sector. The Standing Committee on Climate Action should consider the rapidly evolving international policy landscape in this regard. The Committee acknowledges that farming is by and large a low margin business[60] and the wider Just Transition for the sector should be paramount to these considerations.

8.5 Mitigation potential in agricultural practices identified by Teagasc

In June 2018, Teagasc published *An Analysis of Abatement Potential of Greenhouse Gas Emissions in Irish Agriculture 2021-2030*. The report identified three broad classes of mitigation pathways:

1. Agricultural mitigation (improved breeding, changing fertiliser types and slurry spreading);
2. Land use - Carbon sequestration (increase broadleaf forestry, improved pasture management); and
3. Energy efficiency and fossil fuel displacement (biofuel and anaerobic digestion (AD))

In total 28 measures were identified which, if implemented could deliver up to 17.2 $MtCO_2$-eq emissions savings between 2021 and 2030, representing a substantial contribution to meeting our 2030 emissions targets. According to the Department of Agriculture, Food and the Marine that is a challenging target, but it is important, in the view of the Committee, that all steps now be put in place to drive these changes. This should form a central part of the considerations outlined previously on policy development under the next round of CAP. Some of these measures remain subject to further research and may be particularly challenging.

Challenges include getting farmers to better manage the use of artificial fertilizer by addressing issues around soil fertility, especially the need to bring lime pH to its optimal level. In that regard, there is the potential to mitigate up to 0.5 $MtCO_2$-eq annually by changing fertilizer type and there is a need to bring forward proposals to implement that change. The Department of Agriculture Food and the Marine in conjunction with Teagasc and the EPA should undertake a review of nitrogen fertiliser management and imports in 2019, in light of the impacts of nitrogen on soil fertility, as well as EU climate and nitrate obligations.

The Committee believes that it is important to implement the Teagasc recommendations in full and that Government should develop a strong implementation plan, working with farming groups to promote uptake. The initial focus should be on verifiable mitigation measures identified as having the greatest GHG reduction potential. These should be implemented as soon as possible and on a

[60] The 2018 *National Farm Survey* indicates that average family farm income was €31,374 in 2017 (this varied from €86,069 for dairy farmers to €12,529 for farmers involved in cattle rearing).

sustained basis. In addition, the Committee would welcome an independent assessment of Teagasc's GHG emissions abatement measures with a view to ascertaining whether there are additional avenues that could be pursued by Teagasc in future.

8.6 Bottom-up engagement by the agricultural sector

8.6.1 Knowledge sharing

Knowledge transfer and communications between farm bodies, farm advisors and farmers and peer learning are crucial to assisting farmers with the transition to low carbon agriculture. Without farmer understanding and subsequent buy-in, change will not occur. The Committee was advised of international exemplars in the session on the IPCC SR1.5 report [61] and thus the forum on agriculture should have the capacity to learn from international examples. Specifically, the Committee recommends increasing knowledge transfer in the following areas:

- Expand the Sustainability Dialogue hosted by the Department of Agriculture Food and the Marine (DAFM) in summer 2018;
- International cooperation through collaborating with other jurisdictions with similar agriculture sectors on solutions to reduce emissions (e.g. New Zealand). Ireland has the potential to show leadership and define best practice;
- Establish Knowledge Sharing Programmes between co-ops and state agencies; and
- Establish both a National Forum and regional fora on the Future of Farming in Ireland to have a dialogue on where the sector is going and how to manage the low carbon transition. Regional fora may appropriately recognise that the challenges and opportunities for the sector vary on a regional basis.

All such knowledge transfer programmes should recognise, respect and build on the qualities, resilience and adaptability that defines our farmers.

8.6.2 The role of young farmers

The Committee heard from Macra na Feirme about the importance of supporting young farmers and providing them with greater opportunities to develop more carbon friendly farming practices, for example, through the Young Beef Farmers scheme. Currently only 7% of farmers are under 35 years of age. One of the biggest challenges young farmers face is access to land. Greater support of schemes such as the Land Mobility Scheme (which matches old farmers with young farmers) and increased incentives to encourage older farmers to step back from farming and to move towards passing / renting out their land to younger farmers should be promoted. As well as this, a greater focus on research into land diversification at agricultural colleges and also in the EPA and Teagasc would help educate farmers on the benefits of diversification.

[61] Committee on Climate Action debate, 21 November 2018. Debate available at: https://www.oireachtas.ie/en/debates/debate/joint_committee_on_climate_action/2018-11-21/ [accessed on 12.03.2019]

8.7 Agricultural sector diversification

A key aspect of successful agricultural mitigation efforts will be land-use diversification. Farmers need support to reduce GHG emissions, while ensuring they can make a living for their families, have an acceptable work/life balance and pay any debts incurred from expansion. Diversification of the farm system to include elements of production such as horticultural produce has been shown to enhance the rural economy while maintaining jobs and profitability at farm level. Diversified farms tend to generate more employment per hectare than highly specialized ones.[62] The Committee heard of the UK experience where there is now a move away from an overreliance on single modes of production, and it is the Committee's view that this is an issue that should be addressed in Ireland, independently of climate action considerations. Diversification can also meet some of the needs for adaptation in the sector. Extreme weather events of the last 12 months (storms, snow, heatwave and drought) illustrate the vulnerability of the sector to climate change and highlight the need for adaptation.

The Committee recommends the establishment of a multi stakeholder forum for developing programmes and schemes to support diversification in agriculture. The role of the forum will be to identify the full range of opportunities for diversification, including horticultural production, biomass production, growing alternative crops such as willow and hemp, and others. Diversification options should assess emissions reductions potential, the grants needed, training needs, peer learning structures, potential for economic viability and employment opportunities of each type of diversification. Research needs should be identified and pursued as appropriate. Given the overall economic and social aspects that will be implicit in this research, the Committee is of the view that the National Economic and Social Council (NESC) is best placed to undertake the work and it will propose a recommendation to the Department of the Taoiseach in this regard.

8.7.1 Horticultural production

There is a very wide range of vegetable and fruit crops that can be grown in Ireland, the production of which could be introduced or increased at commercial scale. Furthermore, there is a growing global trend, supported by advice in recent scientific studies[63], towards a more plant based diet. The trend towards more plant-based diets represents a commercial opportunity which Irish horticulture should avail of in the transition to a sustainable, low-carbon food system. Major opportunities exist through import substitution in horticulture that would improve national food security, increase sustainable rural employment, promote a healthier diet nationally and fight obesity as well as reducing GHG emissions. Horticulture (€433m 2017) is the 4th largest sector in terms of gross agriculture commodity output value with only the dairy, cattle and pigs sectors being larger. Despite its relative scale, horticulture has very few Teagasc advisers and more advisory supports are required to encourage greater food crop production.

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[62] Dr Pierre-Marie Aubert stated that there will be costs to diversifying the sector but moving away from intensive livestock farming systems can also generate opportunities in terms of rural employment, as diversified farms can generate more employment per hectare than highly specialized ones.

[63] IPCC, 2014. *Fifth Assessment Report* (5AR) [online]. Available at: https://www.ipcc.ch/assessment-report/ar5/ and Summary report from the EAT-Lancet Commission, 2018. *Healthy diets from sustainable food systems, Food Planet Health* [online]. Available at: https://eatforum.org/content/uploads/2019/01/EAT-Lancet_Commission_Summary_Report.pdf [both accessed on 14.03.2019]

8.7.2 Organic farming

While the Citizens' Assembly did recommend more support for organic farming, it was an issue that the Committee did not consider to any degree. The Committee welcomes the publication by the Department of Agriculture, Food and the Marine of its Strategy for the Organic Sector (2019-2025), and establishment of an implementation group. Other European countries have shown that there is a lucrative and high value market for agricultural produce from organic farming systems. We should also learn from the UK experience where policymakers are now trying to move from an industrial agricultural model due to the associated loss in soil fertility.[64] The Committee recognises that there is a role for organic farming, which is a small but important and growing market. The State's role in broadening opportunities for organic farming should be examined by the Standing Committee on Climate Action.

8.8 Smart farming schemes and the role of advisory support

The Committee is of the view that it is necessary to expand and strengthen the Smart Farming Programme, Dairy Sustainability Ireland, Agricultural Sustainability Support and Advice Programme[65], and Origin Green Programme to improve the environmental performance of farms and increase visibility of these schemes. The Committee heard evidence that more than 50,000 farmers and 350 companies are in the Origin Green programme.[66] The 350 companies represent over 90% of all our food and drink exports. All farmers in the programme are carbon foot-printed every 18 months.[67] In order to promote the necessary degree of change, farmers should have the opportunity to engage with specialist advisors. To this end, Teagasc advisors should play a more proactive role in advising farmers on more sustainable practices but without imposing additional advisory costs on farmers, especially to those on low income. The State, working with industry, should also build on and expand the remit of the recently launched Sustainability Support and Advisory Programme (a new approach to achieving improvement in water quality involving the establishment and joint funding of a resource of 30 Agricultural Sustainability Advisors). Membership in the scheme should require Nutrient Management Planning (NMP) for all farms.

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[64] Evidence from Lord Deben at the Committee on Climate Action debate, 19 December 2019. Available at: https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_climate_action/2018-12-19/debate/mul@/main.pdf [accessed on 14.03.2019]

[65] Dairy Sustainability Ireland (DSI) is a collaborative initiative of industry, producers and public agencies established to help farmers meet environmental targets by focusing on targeted fertiliser application to enhance soil fertility as well as water course protection. This work has in turn contributed to the development of the Agricultural Sustainability Support & Advisory Programme (ASSAP), a collaborative initiative to facilitate improvements in water quality. The ASSAP involves a resource of 30 Agricultural Sustainability Advisors, 20 of whom are funded by Government and 10 by the Dairy Industry. These Advisors will promote on-farm best practice to farmers in 190 'Areas for Action', which have been identified by the EPA where the status of the water is at risk of regressing". Transcript available here and here.

[66] over 90% of the beef produced in the country comes from Origin Green farmer members while more than 95% of dairy farmers are members

[67] Evidence from Bord Bia at the Committee on Climate Action meeting, 7 November 2018. Transcript available at: https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_climate_action/2018-11-07/debate/mul@/main.pdf [accessed on 25.03.2019]

8.9 The role of agriculture in the energy transition

8.9.1 Anaerobic Digestion

Anaerobic digestion (AD) is one of the measures identified by the Teagasc report. Unlike other EU countries, AD is very much an under-developed practice in Ireland. AD is a process through which slurry or farm waste is mixed with other organic feedstocks such as silage and/or food waste and broken down through an anaerobic (without oxygen) digestion process to produce biogas and high-quality fertiliser [68]. AD as a method of producing biogas came up repeatedly during Committee discussions as a way for farmers to better manage their slurry while generating a renewable source of heat and electricity at the same time. Any excess biogas from the AD process could be purified to bio-methane and exported to the gas grid or used on site for heat or power generation. The scale requirements mean that any commercial venture would require groups of farms to participate. There is the need for a detailed assessment to inform national strategy that evaluates the volume of biogas that would be sustainably available from such systems, potential environmental side effects, and other impacts on competing use of grasslands, such as silage production. As a part of this, the Government should commission a feasibility assessment for the development of biogas as an indigenous source for on-demand electricity power, for use as a transport fuel and as a source for heating supply.

8.9.2 AD Co-ops

Subject to the results of the assessment, the Committee recommends the establishment of AD/ Biogas co-ops. Anaerobic digestors are expensive and their installation could be facilitated by low interest loans or grants. In conjunction or alternatively, the Department of Agriculture, Food and the Marine could consider purchasing digestors in bulk and passing discounts on to co-ops. The Committee heard in evidence that Gas Networks Ireland (GNI) has started the roll out of a compressed natural gas (CNG) network on our motorways which can then be used as a pathway to the introduction of biogas in the system (Chapter 10, *Transport*). This biogas could connect farm and/or community AD with grid / injection points.

8.9.3 Funding AD

Clearly further work needs to be done on the development of AD and the Committee welcomes the decision to fund further development through the Climate Action Fund. There is now a need to bring AD to the next phase and the Standing Committee on Climate Action should actively pursue its development potential with the public bodies in both the energy and agricultural sectors. As an indication of what is possible, the GNI GRAZE (Green Renewable Agricultural Zero Emissions) Gas project received up to €8.5 million under the Climate Action Fund. Located in Mitchelstown, County Cork the project will enable the injection of large amounts of biogas onto the natural gas network. The biogas will be produced from AD being developed on farms in the area.[69]

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[68] Although it should be noted that AD does not break down nitrates

[69] GNI, 2018. *Major step forward to bring renewable gas on to gas network* 28 November [online]. Available at: https://www.gasnetworks.ie/corporate/news/active-news-articles/major-step-forward-to-bring-renewable-gas-on-to-gas-network/ [accessed on 07.02.2019]

8.9.4 Biomass

Support for a sustainable indigenous biomass sector could assist farmers in diversifying land use. Only sustainably sourced indigenous supplies of biomass should be supported by Government policies and schemes. The Climate Action Council should be invited to develop comprehensive sustainability criteria for biomass production no later than end 2020. This should ensure that land management practices contribute to biodiversity and environmental objectives and prevent further negative environmental impacts. It would be prudent to set a cap to limit the use of biomass for energy production to levels that can be sustainably supplied so that investments in both the technology and the biomass production are low-risk. Biomass is discussed in more detail in Chapter 7, *Energy, paragraph 7.7.2*

8.9.5 Other renewables

There is enormous potential for the agricultural sector to become a net producer of renewable electricity, such as solar, once barriers on grid access and tariffs are overcome as noted in Chapter 7, *Energy*. This would provide an additional valuable income stream to farmers.

8.10 National review of land use

The Committee notes that a national review of land use would be extremely useful in furthering understanding of how to optimise planning. This analysis of potential should balance environmental, social and economic considerations and involve a process of evaluation of the ecological characteristics of the land, its suitability for different types of production, and measurement of nutrients and efficiencies of production. It should also include adaptation co-benefits such as rewetting or forest regrowth to mitigate flooding risks in river catchments. Such a review would allow a knowledge transfer to landowners who could then make an informed choice of how best to use the land while benefiting from supports and incentives. The Committee notes the work being done by the UK Climate Change Committee which has very recently published a report *Land Use Reducing Emissions and Preparing for Climate Change* on the matter and the approach is worthy of consideration in Ireland. Such a national land-use review should inform the CAP scheme payments (see section 8.4.1) by providing appropriate specific payment supports to ensure optimal land use options are availed of. The Committee invites the Climate Action Council in conjunction with other relevant bodies to complete such a review by spring of 2020.

8.11 Biodiversity and hedgerows

The Committee recognises that climate change is anticipated to affect all levels of biodiversity. The Committee was told of increasing conservation concern for at-risk bird species and notes that one-third of Ireland's wild bee species are threatened with extinction.[70] The Committee acknowledges that habitat loss and degradation caused by human activities are the primary cause of impacts, and that actions to protect and restore habitats can provide valuable co-benefits for climate change mitigation and adaptation as well as threatened wildlife. The Committee recognises that there are a

[70] Submission to the Joint Oireachtas Committee on Climate Action from BirdWatch Ireland (submitted to the Committee on 21.01.2019)

number of nature-based solutions that both mitigate climate change and help create landscape resilience in the face of climate change.

The contribution of hedgerows to climate adaptation as well as to carbon sequestration and storage is recognised by the Committee. Hedgerows that are maintained in a state favourable to conservation are also important for wildlife, water quality, and flood management in addition to acting as field boundaries with benefits to farm activities. Further work now needs to be done to maximise the biodiversity and climate benefits of the national hedgerow resource, namely: to complete county based hedgerow surveys; [71] to further understand the current capacity and potential of hedgerows to store and sequester GHGs; and to prepare a national hedgerow conservation strategy in light of these findings.

As well as diversifying production, the Committee is of the view that under the CAP and other national funding sources, a range of payment schemes should be made available (or extended where currently available) for land uses which deliver specific climate and environmental benefits, including:

1. Rewarding landowners for active maintenance of ecosystems, including rewetting of agricultural peatlands;
2. Measures to develop an indigenous sustainable biomass industry;
3. Riparian planting;[72]
4. Agro-forestry;[73]
5. Greater support for alternative crops such as: hops, flax, hemp, soyabean meal; as well as protein crops such as peas, beans, lupins and clovers;
6. Extending the width of uncultivated field margins around arable lands; and
7. Ensuring the eligibility of farmers for CAP payments on areas of existing marginal/ uncultivated/overgrown lands, so they are not perversely incentivised into reclaiming them.

8.12 Afforestation and forest management

The Committee, in accepting the recommendation of the Citizens' Assembly, was not in a position to examine afforestation in any level of adequate detail. Nonetheless the Committee notes general concerns regarding future afforestation policy and acknowledges the shortcomings of current and previous policies. Whilst investment in fast growing conifers has proven commercially profitable and supported local employment, the Committee recognises that there are problems with the planting, management, and clear-felling of these Sitka spruce plantations, including impacts on biodiversity and water quality. There is also a growing resistance in regions where there have been high planting rates, where it is considered to have negative impacts on communities and the Committee notes that the Department of Agriculture, Food and the Marine has commissioned a

[71] Hedgerow surveys have been completed by the local authorities for 17 counties based on a standardised national methodology. Surveying the outstanding counties will complete the national survey

[72] **Riparian planting** relates to the planting of trees etc. between the fence line and the watercourse on the farm. As well as acting as a carbon sink, it offers many other environmental benefits including flood protection by reducing and slowing the flow of water from land to river channels and reduced soil quality depletion, stops chemicals and slurry leaching into the river, and creates wildlife corridors.

[73] **Agro-forestry** is when trees are grown in conjunction with crops and help, e.g. reduce soil erosion (silvoarable) and /or when the understory of trees is used for grazing and the trees are used for e.g. timber / food production (apples, pears etc.) and shelter (silvopasture). The trees are also a valuable shelter belt which is a positive for animal welfare and crop growth. Tree roots capture nutrients lost from crops through the soil and pull them back up thereby reducing water pollution. It is also possible to use nitrogen-fixing trees.

study into the effects of forestry plantation in County Leitrim. The findings of this study should inform future forestry policy and be referred to the Standing Committee on Climate Action. The Committee recognises the greater carbon storage and sequestration role of broadleaf forests and wishes to see reformed forest policy that would give stronger incentives to landowners to plant broadleaf species instead of conifers such as Sitka spruce.

The Committee also acknowledges that the targets for afforestation which rise incrementally to 8,100 hectares per annum from 2020[74] represent a significant shift from food to timber production, and this merits an analysis to quantify the potential GHG abatement value against the impact on the agri-food sector. It is a matter that must be thoroughly addressed in the preparation of the National Forestry Programme 2021-2027. That Programme must rectify the failure to date to meet national afforestation targets and the fact that the rate of new afforestation has fallen in recent years. The following additional issues will need to be addressed:

1. The Forestry Programme should target increased levels of planting on public lands to accelerate and significantly increase new planting;
2. Support schemes should offer significantly larger incentives, over a longer time-frame, for broadleaf planting, so that it becomes more financially rewarding than conifer planting;
3. A target for farm based tree planting with copses of native trees should be set. A target of 5% would increase our low tree cover by 4% and provide environmental benefits and employment opportunities;
4. Knowledge transfer programmes to allow land-holders to engage in diverse agro-forestry projects and to ensure that the trees planted are location appropriate and best practices followed;
5. The need to balance afforestation with community development so as to address community resistance; and
6. Continued support for the promotion of wood and timber products and development of the Irish bioeconomy given its potential to play a key role in carbon sequestration in buildings and timber products.

Ecological assessments of all afforestation applications (outside of EU designated sites[75]) are required to mitigate the loss of biodiversity-rich areas to forestry, to avoid impacts on water resources and water quality, and to protect ground nesting birds, pollinators and species-rich grasslands.

Continuous Cover Forestry (CCF) approaches to forest management maintain the forest canopy at one or more levels without clear felling. CCF results in diverse forests of mixed aged stands, with a dominance of broadleaved trees. Because of the continuous nature of forest cover and reduced soil disturbance, CCF greatly increases carbon storage and is thus more appropriate to climate change mitigation and adaptation than clear-fell and replant forest management. Such active management requires a greater level of skilled forest management employment bringing economic

[74] Government of Ireland, 2018. *National Development Plan 2018-2027* [online]. Available at: https://www.per.gov.ie/en/national-development-plan-2018-2027/ page 52. Accessed on 23.03.2019

[75] Designated sites in this instance refer to those sites of nature conservation importance which are part of the pan-European Natura 2000 network. The Natura 2000 network is made up of sites designated as Special Areas of Conservation [SACs] for habitats and species under the Habitats Directive and Special Protection Areas for birds [SPAs] under the Birds Directive.

opportunity. CCF has also been shown to be more resilient to the impacts of climate change, such as increasing pests, disease, fire and storm damage.

Initiatives are needed to encourage and facilitate the widespread application of CCF methods to existing and new forestry in Ireland, including policy, demonstration, grants structures, support, research, and training of forestry professionals. The Committee recommends that the Standing Committee on Climate Action investigate further how CCF approaches to forest management in Ireland can be supported for a more widespread uptake and associated increases in carbon storage and sequestration. One specific and immediately applicable recommendation is to greatly diversify the species mix and structural complexity of existing and new forestry to garner greater public acceptance of forestry, greater community engagement and increased employment associated with CCF.

The Climate Action Council should conduct a comprehensive review of national forestry in relation to climate change mitigation and adaptation. This should include the following issues:

1. Climate mitigation potential of the various approaches to forest management;
2. Mitigation and adaptation potential of increasing the proportion of native and broadleaf species;
3. Assessing the potential of introducing requirements to convert Sitka spruce plantations into more mixed stands and the associated climate and ecological benefits of this;
4. Assessing the wider environmental co-benefits of various forest management approaches including biodiversity, water quality and flood management;
5. employment opportunities; financial supports;
6. potential for recreational co-benefits; and
7. community acceptance and resistance.

The results from this review should feed into the Department of Agriculture, Food and the Marines preparation of the National Forestry Programme (2021-2027), which should also consider the forestry recommendations set out in this report. The Department should bring forward a draft of the forestry programme to the Standing Committee on Climate Action no later than 2020. In addition, the Government should commission an independent review and sustainability audit of Coillte's forest business and other activities in 2019, in conjunction with a review of the Forestry Act, 1988 to ensure that policy is consistent with the objective of environmental, social and economic sustainability in this sector.

8.13 Peatland Restoration

Peatland restoration was highlighted as a priority by the Citizens' Assembly. Currently only 1% of peatlands in Ireland are under rehabilitation or restoration. The potential for jobs through peatland restoration and rehabilitation projects has not been capitalised on despite being partially recognised by Government in the *Action Plan for Jobs* 2013 (action 306). The prime action of rehabilitation is rewetting, defined as 'the deliberate action of raising the water table on drained soils to re-establish water saturated conditions'[76] which can stop continued release of GHGs from

[76] IPCC, 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands* [online]. Available at: https://www.ipcc.ch/site/assets/uploads/2018/03/Wetlands_Supplement_Entire_Report.pdf [accessed on 22.02.2019]. Page 3.5

these peat bogs. Management approaches are highly site specific and significant efforts are needed to develop and instigate measurement and verification approaches in this area. Teagasc should carry out research on the potential for productive use of rewetted peatlands such as paludiculture.[77]

The Committee notes the fragmented approach to peatland management, with different peatland types falling under the remit, and often between the stools, of several Government Departments and State Agencies. The committee notes the National Peatland Strategy calls for collaboration and partnership in the management of peatlands and notes the need for an informed national policy on managing peatlands for their GHG emissions. The Standing Committee on Climate Action should examine the current policy framework on peatlands for coherence and comprehensiveness and the effectiveness of peatland restoration for climate mitigation.

Healthy peat bogs store huge quantities of fossil carbon which can be locked away for millennia. When peat bogs are drained and harvested this stored carbon is released into the atmosphere. Because we have already drained and depleted most of our peat bogs in Ireland, drained peat soils are a significant source of GHG emissions to the atmosphere. At the national level, Irish peatlands are a large net source of carbon, estimated currently at 10 Mt CO_2/year[78]

There are numerous types of peatland restoration. First there is the restoration of conservation worthy peat bogs, also referred to as natural peatlands, which have been drained and /or harvested to some extent, but which still have most of the peat layer and are capable of being restored to ecologically functioning peat bogs with associated benefits to biodiversity and carbon sequestration. This is being carried out at present by the EU funded LIFE project, the 'Living Bog', which is restoring 12 of Ireland's unique raised bog SACs in seven counties. The project will improve over 2,600 hectares of threatened raised bog habitat. Some degree of restoration work has also been carried out by Coillte in protected bogs in their ownership since 2002, with over 3,000ha of raised bog and blanket restored. There is a need to roll out this approach to all designated bogs (Special Areas of Conservation for habitats and species [SACs], Special Protection Areas for Birds [SPAs] and Natural Heritage Areas [NHAs]) as set out in the National Peatland Strategy. Table 1 hereunder sets out the distribution of the main land use categories of peatlands.

[77] Paludiculture is the wet alternative to drainage-based use of degraded peatlands. Further information available at: https://www.ramsar.org/sites/default/files/documents/library/7_tanneberger-_paludiculture_in_europe.pdf [accessed on 23.03.2019]

[78] EPA and DEHLG, 2011. *Bogland: Sustainable management of peatlands in Ireland (STRIVE report series no. 75)* [online]. Available at: http://www.epa.ie/pubs/reports/research/land/STRIVE_75_web_SC.pdf [accessed on 14.03.2019]. This report states in its executive summary that: "However, damaged peatlands are a persistent source of carbon dioxide (CO2) and, at the national level, Irish peatlands are a large net source of carbon, estimated currently at around 2.64 Mt C/year." This figure of carbon equates to 9.68 Mt of CO2

Table 1: Distribution of the main land use categories of peatlands[79]

Peatland category	*hectares*
Natural peatlands	269,270[a]
Cutover peatlands (affected by domestic turf-cutting)	612,380[a]
Afforested peatland	301,700[b]
Farmed peatland (grassland and cropland)	295,000[c]
Industrial cutaway peatlands	70,000[d]
Rehabilitated cutaway	18,000

Given the significant sequestration potential of peatlands, the Committee recommends that the Climate Action Council in conjunction with the National Parks and Wildlife Service, develop a verifiable pathway in line with the overall national targets set out in Chapter 1 to achieve net sequestration nationally by 2050. This pathway should reflect the IPCC SR 1.5 which states that in order to keep temperature rises below 1.5°C requires global GHG emissions reductions from 2010 levels of 45% by 2030 and to be net-zero by 2050. This will also address the urgent need for the restoration, rehabilitation and rewetting of all peatlands. In recognition that there are numerous types of peatlands in Ireland with differing management and restoration challenges, this pathway should include the development of a set of scientifically informed targets for the rehabilitation and restoration of natural peatlands, cutover peatlands, afforested peatlands, farmed peatlands, and industrially cutaway peatlands by Q1 2020. The Committee will examine peatland restoration in greater detail in 2019 with a view to identifying the policies and measures to support the delivery of these targets. In addition, the IPCC is due to publish a Special Report on Climate Change and Land (SRCCL) in August 2019. Its findings should be taken into account when calculating the verifiable pathway and associated targets to achieve net sequestration nationally by 2050 proposed above.

The Government should assign responsibility for a national programme of rewetting and restoration for inclusion in Budget 2020 based on the Climate Action Councils recommendation. This should be provided for in the National Energy and Climate Plan (NECP) along with adequate multi-annual funding and resources to deliver this target.

Rewetting industrially harvested peat bogs is a very different exercise, carried out primarily for managing GHG emissions from the harvested sites rather than restoring peatland habitats. When

[79] From 'Peatlands' by F. Renou-Wilson, School of Biology and Environmental Science, University College Dublin. Published by Springer International Publishing AG 2018 R. Creamer and L. O'Sullivan (eds.), 'The Soils of Ireland', World Soils Book Series. The figures within Table 1 are referenced in this book as follows:
[a] Malone, S, and C O'Connell. 2009 Ireland's Peatland Conservation Action Plan 2020—Halting the Loss of Biodiversity. Irish Peatland Conservation Council, Lullymore
[b] Black, K., O'Brien P., Redmond J., Barett F. & Twomey M. 2008. The extent of recent peatland afforestation in Ireland. Irish Forestry 65 (1&2): 71–81
[c] CRF Table 5.C, National Inventory Report 2007–2009 (Environmental Protection Agency)
[d] 57,000ha (including hard surfaces and fringes) belongs to Bord na Móna and the remainder is an estimate of the area that is cutaway by private companies extracting peat mainly for horticulture

harvesting stops, as is planned in coming years for many Bord na Móna bogs, peatlands continue to emit GHGs unless they are actively rewetted. The Committee looks forward to engaging with Bord na Móna on its plans with regard to its land bank of cut-away bogs.

8.14 Food waste

The recommendation on reducing food waste from the Citizens' Assembly is accepted in principle. Because of time constraints on the Committee, it was not possible to examine issues around the elimination of food waste. It is an extremely important matter that needs to be addressed by the proposed Standing Committee on Climate Action. In the interim, the Committee recommends reviewing the role Origin Green plays in reducing food waste building on existing supports for initiatives such as Food Cloud and, for example, use-by vs. best before dates, and increasing spending on R&D to extend the shelf life of products and efficiency of production. The Committee recommends that the Department of Agriculture, Food and the Marine in conjunction with relevant public bodies examine the need for public information programmes on the climate and environmental impact of food choices and on the elimination of food waste with a view to improving citizens' habits and consumption patterns. The Department should present their findings to the Standing Committee on Climate Action by 31st December 2019.

8.15 The Bioeconomy

There is huge potential in Ireland based on its large agri-food sector to become a leader in development of a thriving bioeconomy. The Government issued a National Policy Statement on the Bioeconomy in February 2018, and an implementation group led by the Department of Communications, Climate Action and Environment and the Department of Agriculture, Food and the Marine is due to report shortly. The National Policy Statement references how favouring renewable biological over fossil fuel-based resources through the expansion of the bioeconomy, whilst keeping sustainability concerns to the fore, can contribute towards meeting Ireland's climate change targets. The bioeconomy can open up new business models and income streams for farmers, as well as promote more efficient and sustainable use of resources. The Committee invites Government to further progress a strategy on development of the bioeconomy in Ireland to support its growth

8.16 Priority recommendations of the Committee

The IPCC are due to publish a Special Report on Climate Change and Land (SRCCL) in August 2019. Its findings will be relevant to some of the recommendations in this Chapter and its findings should be considered once the report published. In particular, those recommendations hereunder relating to the land use review, to afforestation, forestry and peatlands should all take account of the results of the SRCCL once published.

1. The Committee recommends that the Department of Agriculture, Food and the Marine in conjunction with other Government Departments promptly engage with the farming, environmental and scientific communities to develop a plan for the agricultural sector to align it with meeting Ireland's Paris Agreement commitments. The measures identified through this process should be funded where necessary under CAP. As part of this inclusive process, the Department should:

a. Devise priority proposals for the funding of climate mitigation, biodiversity and carbon sequestration and storage measures under all aspects of the next CAP, to include robust indicators of the impacts of those measures; (Section 8.4)

b. Specify actions and timelines to implement and promote the uptake of the 28 measures contained in the mitigation pathway produced by Teagasc, with a focus on those which have the greatest GHG emissions reductions potential, noting that many of these represent cost savings to farmers; (Section 8.5)

c. Perform a critical review of current national land-use and agricultural schemes, tax credits through the agri-taxation review process, and reliefs, and incentives. In light of this review, make available and promote a range of new schemes (or extend and expand where currently available) which support biodiversity, carbon sequestration and water quality including active rewetting and maintenance of bogs, riparian planting, agro-forestry, continuous cover forestry and hedgerow conservation. (Section 8.10)

d. Respond to the findings of the IPCC Special Report on Climate Change and Land (SRCCL) to be published in August 2019. (Section 8.13)

This process should begin within one month of the publication of this Committee's report with the plan for implementing actions (a) to (d) to be placed before the Oireachtas and the Standing Committee no later than 31 December 2019.

2. The Department of the Taoiseach should establish a multi-stakeholder forum[80] via the NESC on agricultural diversification and climate change, with the purpose of developing a suite of new opportunities for farmers through programmes and schemes to promote diversification in agriculture. This forum should be established by June 2019. (Section 8.7)

3. As knowledge transfer will be central to the delivery of mitigation strategies, it is recommended that the Department of Agriculture, Food and the Marine direct Teagasc to expand the resourcing of the agricultural advisory service to ensure advisors can focus on higher level consultancy work to provide tailored assistance to farmers in making the transition to low carbon farming (without imposing additional advisory costs on low-income farmers). The Department should build on current initiatives that incentivise engagement and peer-to-peer learning engaging all stakeholders (including independent advisors) to drive behavioural change, building on and expanding the remit of the recently launched Sustainability Support and Advisory Programme and the Dairy Sustainability Ireland initiative. The Department should promote increasing knowledge transfer on mitigation measures and opportunities also via farming bodies, farm advisors, farmers themselves, agricultural colleges and third level institutions. (Section 8.6 and 8.8)

4. The Committee recommends that the Government develop a national strategy for sustainable Anaerobic Digestion (AD) as a priority in order to actively pursue the development and facilitation of cooperatives to process slurry via AD to provide heat and energy and fertiliser to the agricultural sector and biomethane to consumers. The strategy should be published in 2019 and include consideration of viability, environmental impact, and potential funding support mechanisms. (Section 8.9)

[80] forum to include as broad a range of stakeholders as possible including farm organisations, agri-food industry, NGOs and community organisations DAFM, DCCAE, Teagasc, the EPA, the Climate Change Advisory Council (or its replacement once established, the Climate Action Council).

5. The Committee recommends that the Climate Action Council in conjunction with other relevant bodies complete a review of national land use by spring of 2020 building on the Areas of Natural Constraint (ANC) review and other relevant analysis on land use. This should inform a national land-use plan, which will advise on suggested land use options in accordance with Ireland's Paris Agreement commitments and the UN Convention on Biological Diversity; balancing social, economic and environmental considerations. The review should inform the development of agri-environment policies, including the new CAP, recognising regionally differentiated strategies may be appropriate. (Section 8.10)

6. The current county-based hedgerow surveys should be extended nationwide by local authorities and once completed, by 2020, the Government should commission a study to quantify the climate mitigation and adaptation functions of this resource by 2021. This should inform strengthened policies, through CAP and other relevant policy instruments, to both improve hedgerow management and the planting of new hedgerows. (Section 8.11)

7. In relation to afforestation and forest management, that:
    a. the Climate Action Council should undertake a comprehensive review of the climate mitigation potential of our forests[81] to be completed by December 2019.
    b. The results from this review should feed into the Department of Agriculture, Food and the Marine's preparation of the National Forestry Programme (2021-2027), which should also consider the forestry recommendations set out in this report. The Department should bring forward a draft of the forestry programme no later than 2020.
    c. The Government should commission an independent review and sustainability audit of Coillte's forest business and other activities in 2019, in conjunction with a review of the *Forestry Act, 1988* to ensure that policy is consistent with the objective of environmental, social and economic sustainability in this sector. (Section 8.12)
8. Given the significant sequestration potential of peatlands, the Committee recommends that the Climate Action Council together with the National Parks and Wildlife Service develop a verifiable pathway for the rehabilitation and restoration of various peatland types in line with the overall national targets set out in Chapter 1 to achieve net sequestration from peatlands nationally by 2050. This pathway should include the development of a set of scientifically informed interim targets for various peatland types. The Government should assign responsibility for a national programme of rewetting and restoration for inclusion in Budget 2020 (Section 8.13)

[81] This should include a focus on the issues set out in pages 72 - 74 of this chapter.

Chapter 9: Built Environment

9.1 Introduction

This Chapter focuses on lowering GHG emissions from our residential and public building stock which represented 11% of our overall GHG emissions in 2017. [82] Our housing stock emits approximately 6 $MtCO_2$-eq per annum.[83] The chief policy challenge is that a lot of Irish homes have a low Building Energy Rating (BER), and the majority of those are using fossil fuel in the form of oil, coal, peat or gas for heating. The key task we now face is to convert the existing housing stock to low energy homes, where improved insulation and energy performance reduces energy demand and the energy that is used comes from renewable sources.

There are about 1.5 million residential homes in Ireland that need retrofitting. At present the vast majority of houses that are over five years old are heated using fossil fuels and while 300,000 houses have benefited from retrofitting grants, we need to ramp up ambition as we move to increase energy efficiency and phase out fossil fuel use. This is an enormous task and will need buy-in from citizens, the bulk of whom will need financial help in order to undertake this work. The majority of households will need the schemes to be tailored so as to ensure that lower income householders are enabled to engage in retrofitting. There is also a need for specific measures for the large rental market so that tenants are not locked into high carbon living and high energy costs. Finally there is substantial work to be done by the State in respect of public buildings, and schools and hospitals in particular, to decarbonise their energy usage.

9.2 Citizens' Assembly Recommendations

The Citizens' Assembly made two voted recommendations and one ancillary recommendation relevant to the topic of the built environment as follows:

R2: 100% of the Members recommended that the State should take a leadership role in addressing climate change through mitigation measures, including, for example, retrofitting public buildings, having low carbon public vehicles, renewable generation on public buildings and through adaptation measures including, for example, increasing the resilience of public land and infrastructure.

R4: 96% of the Members recommended that the State should undertake a comprehensive assessment of the vulnerability of all critical infrastructure (including energy, transport, built environment, water and communications) with a view to building resilience to ongoing climate change and extreme weather events. The outcome of this assessment should be implemented. Recognising the significant costs that the State would bear in the event of failure of critical infrastructure, spending on infrastructure should be prioritised to take account of this .

AR4: All new buildings should have a zero or low carbon footprint and planning permission should only be granted for new builds which comply with these requirements. The Government should provide incentives to retrofit homes to achieve better energy efficiency ratings.

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[82] The 11% is made up of residential 9.5% and Public Services 1.5%. Source: EPA, 2018. *Ireland's provisional GHG emissions 1990-2017* [online]. Available at: http://www.epa.ie/pubs/reports/air/airemissions/ghgemissions2017/Report_GHG%201990-2017%20November%202018_Website.pdf [accessed on 06.02.2019]. Page 5

[83] As outlined by the SEAI, *"Irish homes emit almost 60% more CO_2 than the average EU home*.". Ref: SEAI, 2018. *Energy in the residential sector, 2018 Report* [online]. Available at: https://www.seai.ie/resources/publications/Energy-in-the-Residential-Sector-2018-Final.pdf [accessed on 06.02.2019]

As outlined in Chapter 1, *The need for a new national framework* because of time restrictions on the Committee, a review of the adequacy of adaptation measures will fall to the Standing Committee on Climate Action.

9.3 Energy retrofitting of existing housing stock

The Committee heard that to date approximately 300,000 housing units have benefited from at least a 'shallow' retrofit, but many of these will require further work. At present the number of households availing of grants under SEAI schemes is running at 30,000 per year, and under the NDP that figure is planned to increase to 45,000 per year from 2021 onwards, bringing these houses to a BER of B. However, there were 1.7 million permanent housing units occupied at the time of the 2016 Census and according to the SEAI only about 15.6% have an A or B BER (A being the most energy efficient rating for buildings to G being the least energy efficient). That would suggest that the requirement for retrofitting is of the order of at least 1.5 million houses. This figure includes 130,000 social housing units that are the direct responsibility of housing authorities.

The Committee notes that the 2017 Periodic Review Report of the Climate Change Advisory Council estimated that Ireland needed to be retrofitting 75,000 homes per year in order to meet the 2020 energy efficiency target.[84] A re-evaluation of the scale of the retrofitting programme is now required to ensure that we meet our 2030 targets, and achieve net decarbonisation by 2050. What is clear is that the 45,000 properties per annum in the NDP will not be adequate. The Climate Action Council should review and report back to the Standing Committee on Climate Action on the level of ambition now required to meet our international emissions targets. That review should take account of the need for new housing construction to provide for Ireland's growing population which will necessarily draw from the same workforce.

Ambitious policies to deliver needed emissions reductions in the built environment sector will not be achieved easily. For instance, barriers that make householders reluctant to engage in retrofitting will have to be overcome.. The biggest of these barriers relates to cost and this is addressed in Chapter 6, *Incentivising Climate Action* where there is a recommendation for targeted support to lower income households. The cost of retrofitting when set against the value of the property and the level of current indebtedness of householders will have to be considered. It may be uneconomical to carry out a deep retrofit to that part of the housing stock which has a low value. Other measures should be considered to address this problem, including insulation and replacing single glazed windows.

In terms of deep retrofitting, this is likely to happen as part of a major refurbishment project and all renovations that cover more than 30% of the floor area of a house should henceforth be required to be retrofitted to have a BER of A or B. There are opportunities to upgrade the energy efficiency of houses as part of the 'churn' process which in Ireland is once every twenty years or so. There is a need to ensure, therefore, that all grant-aided deep retrofits achieve a nearly zero energy buildings (NZEB) standard.

[84] CCAC, 2017. *Periodic Review Report 2017* [online]. Available at: http://www.climatecouncil.ie/media/CCAC_PERIODICREVIEWREPORT2017_Final.pdf [accessed on 07.03.2019]

The Committee would like the Government, through the Department of Housing, Planning and Local Government, the Department of Communications, Climate Action and Environment, the SEAI and the various housing authorities, to pursue, commencing in 2019, the following measures:

1. To prepare for greatly increasing the rate of deep energy retrofitting to meet our 2030 and 2050 energy efficiency targets, a needs assessment must be carried out by Q2 of 2020 to determine what will be required;[85]
2. That funding should immediately be targeted at the retrofitting of homes that use solid fuel (such as coal and peat) or that doesn't have any central heating;
3. A second priority is the 40.4% of households that use oil as their home heating source;
4. Finally the 33% of households that use gas will need to be addressed, many of these are in urban areas and are on the natural gas network; and
5. Research into those factors that currently inhibit the uptake of deep retrofitting projects. This may include aspects around cost, disruption, service provider availability, and the potential role of community energy groups.

Finally, the Committee will recommend that the Climate Action Council examine the phasing out of the sale and installation of fossil fuelled heating system boilers on a staged basis starting with oil-fired boilers.

9.3.2 Energy poverty

Ireland has a significant but largely hidden energy poverty problem affecting an estimated 28% of Irish households.[86] Home owners and tenants experiencing or close to energy poverty tend to live in homes with poor energy performance and are more exposed to negative health impacts associated with cold and damp living conditions. Energy poverty requires a multi-faceted set of policy measures. While energy efficiency improvements alone are not sufficient to lift a household out of poverty, improving the energy performance of a home should reduce the energy bill and improve the health conditions within the household. Energy poverty and health are further discussed in Sections 5.6 and 5.7 of Chapter 5.

9.3.3 The rental sector

An increasing number of households are now in the rental sector and given the current supply shortage in the rental market, there are no incentives for landlords to improve the energy rating of their properties. This is resulting in many tenants being locked into high energy and heating costs. The Committee acknowledges that the Department of Communications, Climate Action and Environment has recently established a Special Advisory Group to consider and make recommendations on proposals to ameliorate the split incentive problem (i.e. where landlords

[85] This needs assessment to address issues of funding, grant structures, the provision of low interest finance, supports for intermediaries including the establishment of community energy co-ops, skills and training requirements for contractors as well as the employment potential and long term savings associated with delivering this target.

[86] DCENR, 2015. *A strategy to combat energy poverty* [online]. Available at: https://www.dccae.gov.ie/documents/A%20Strategy%20to%20Combat%20Energy%20Poverty.pdf [accessed on 07.03.2019]. Cited to the Committee in a submission from MaREI, available at: https://data.oireachtas.ie/ie/oireachtas/committee/dail/32/joint_committee_on_climate_action/submissions/2018/2018-12-12_submission-marei-centre_en.pdf

would incur the cost of improvements, while tenants would reap the benefit in lower energy bills and improved thermal comfort so neither party is motivated to invest to upgrade). As a part of this, a public consultation on proposed approaches to dealing with energy efficiency upgrades in rental properties will take place in the middle of this year as part of the consultation on the next Long Term Renovation Strategy.[87] The outcome of this public consultation should be examined by the Standing Committee on Climate Action

The Committee is of the view that the rental market should prepare for minimum BER standards that should be phased in for residential rental properties starting in 2025. Requiring progressive improvements in BER over specified periods would allow a well-signalled lead-in time for landlords to improve the energy efficiency of residential rental properties. Measures to provide low-cost finance to landlords (excluding financial institutions such as investment trusts) to undertake retrofitting should be considered in this context. The Committee recommend that the Minister for Housing, Planning and Local Government carry out a specific review of how best to improve the energy efficiency of residential rental properties and report to the Standing Committee on Climate Action. That review should also examine measures needed to avoid unintended consequences such as evictions or increased rents for those in private rental accommodation as a result of any regulation, assistance or incentives for retrofitting provided to the private residential market.

The State is the largest landlord in Ireland with around 130,000 tenants in public housing. As with all landlords, the State has a duty to upgrade its housing stock to achieve decarbonisation in this sector. [88] Under the Department of Housing, Planning and Local Governments Social Housing Investment Programme, local authorities are allocated funding to carry out a range of measures to improve the quality of the housing stock which includes retrofitting of older apartments and houses.[89] The Department should increase the level of annual upgrades of social housing where the State is landlord and report to the Standing Committee on Climate Action.

9.4 Energy standards for new builds

New buildings should be constructed in such a manner that they emit low or no GHG emissions. There are many examples of such buildings using a broad range of designs and materials. The Committee recommends that the Department of Housing, Planning and Local Government revise Parts L and F of the Building Regulations that relate to new builds to set a Nearly Zero Energy Building (NZEB) standard) in 2019. Local authorities should be sufficiently resourced to enforce these regulations. The Committee also recommends that these regulations be revised to stipulate that new buildings should, wherever possible, be net energy producers to offset older inefficient buildings.

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[87] Minister Richard Bruton, TD, responding to a Parliamentary Question, 18 December 2018 [online]. Available at: https://www.oireachtas.ie/en/debates/question/2018-12-18/104/?highlight%5B0%5D=split&highlight%5B1%5D=incentives [accessed on 28.02.2019]

[88] Climate Change Advisory Council submission to the Joint Oireachtas Committee on Climate Action

[89] DHPLG, n.d. *Improvements to existing dwellings* [online]. Available at: https://www.housing.gov.ie/housing/social-housing/other/improvements-existing-dwellings [accessed on 28.02.2019]

9.5 Public sector buildings

The *Public Sector Energy Efficiency Strategy* has a challenging target of 33% reduction in energy use by 2020. Since 2009, public sector bodies have made over €1 billion in energy savings and avoided 3.6 million tonnes of CO_2 emissions. These savings have made the public sector 24% more efficient in energy use overall since 2009 which represents progress towards the 33% energy efficiency target by 2020.[90]

However, more needs to be done and the Department of Communications, Climate Action and Environment and the SEAI should examine in 2019, in conjunction with other public bodies, ways of lowering the carbon footprint of all public buildings through the use of district heating (ideally run on renewable energy). All public bodies should produce decarbonisation plans for all of their energy use from now to 2050 with a target of 95% decrease in emissions. This would start with energy efficiency and demand reduction, and be completed through the use of renewable sources of energy.

9.5.1 Schools

The Committee notes the commitment of the Government to undertake a retrofit of all pre-2008 school buildings. The Committee was advised of concerns that new schools built under a major expansion programme since 2015 were not being heated using renewable energy and that gas boilers were still being installed in new schools. As the Committee saw, when it visited Youghalarra National School outside Nenagh in November, it is possible with proper insulation and air ventilation to have schools heated by way of, for example, heat pumps. The electricity to run heat pumps can be generated, for the most part, by solar PV panels on the roof of the school. The Committee further notes the advice of Ms Marie Donnelly, former EU official, [91] that the Government should avoid a situation where there will be a need to retrofit new schools in ten years' time.

It was stated to the Committee that the issue with new schools derived from *Department of Education (2018), Technical Guidance No. 33, School building projects and compliance with Part L of the Building Regulations 2017* which does not encourage the use of biomass heating systems and heat pumps, and states that solar PV must be switched off during holidays etc. where there is no agreement with the energy supplier to export any excess capacity to the grid. The Committee would like to see schools participating in community energy schemes and, therefore, it is essential that any barriers be removed and greater support to schools should be offered by the Department of Education and Skills. The Department should report back to the Standing Committee on Climate Action on how they envisage accelerating the decarbonisation process in schools. Priority should be given to those schools that are currently using oil fired boilers. The Department of Education and Skills should also examine the capacity to bundle retrofit projects so as to achieve economies of scale. They must ensure that schools have the resources and supports to manage the projects

[90] SEAI, 2018. *Annual report 2018 on public sector energy efficiency programme* [online]. Available at: https://www.seai.ie/resources/publications/Public-Sector-Annual-Report-2018.pdf [accessed on 25.03.2019]
[91] Committee on Climate Action hearing with Marie Donnelly, 20 September 2018, available at: https://www.oireachtas.ie/en/debates/debate/joint_committee_on_climate_action/2018-09-20/2/ [accessed on 05.02.2019]

in order to avoid unnecessary delays which can arise if complex project management tasks are left to the school principal.

All new schools, given that they are built to NZEB standard, should use renewable energy technologies to achieve at the very least self-sufficiency in their heat and electricity needs. As well as this, due to the importance of air quality and the availability of fresh air in schools, all deep retrofits of schools should also provide for proper ventilation.

9.5.2 Hospitals

The Committee did not get an opportunity to examine decarbonisation of the health sector and our public hospitals in particular and it is an issue that should be addressed by the Standing Committee on Climate Action. In its visit to Tipperary the Committee saw the successful operation of a biomass boiler to provide some of the heating for a community swimming pool. The Committee also visited a successful district heating project in Cloughjordan. Heating from biomass could also be suitable for large public sector buildings like hospitals where it could also link into district heating projects. Heating and ventilation is particularly important in hospitals and using clean sources of energy generated on site could provide savings to the Exchequer and improve the health and wellbeing of patients.

9.6 The role of planning

How we plan our housing strategy impacts not just built environment emissions but also transport emissions. Proper planning for sustainable, compact development will require residential and commercial development to be sited in locations, ideally, that are accessible by public transport and active modes such as cycling and walking. The Committee did not get time to hear from experts on the matter of planning to the required depth. Noting the need for the Standing Committee to further review the matter, the Committee highlights the importance of implementing Project Ireland 2040 (the National Planning Framework and National Development Plan) for climate action. In order to reduce emissions associated with private car transport and dispersed housing development, it suggests:

i) that there be a planned review, completed by 2020, of all County Development Plans to ensure their consistency with Regional Spatial and Economic Strategies so that all new development is compact, sustainable and ideally, accessible by public transport;
ii) an urgent review of the vacant sites levy mechanism to clarify and strengthen its legal basis, to ensure vacant land in urban areas is targeted for housing development; and
iii) local authorities should identify existing brownfield sites in towns and villages that would be suitable for housing development and should acquire land banks for this purpose.

In addition, local authorities should actively plan and develop district heating systems especially where waste heat is available.

9.7 Job opportunities

The delivery of the deep retrofit programme is contingent on the availability of a skilled labour force in construction. The retrofitting programme will need to be substantively accelerated as noted

earlier in the Chapter. The Committee is cognisant of the strain such increases will place on the construction industry (which also has to deliver 500,000 new housing units projected under the NPF).

A number of issues may need to be addressed in this regard including:

1. The implementation of the Build Up Skills Roadmap (funded under EU Build Up Skills initiative to develop a skills roadmap for the low carbon economy)
2. An examination of the potential with a view to a national roll-out of the Waterford Wexford Education and Training Board training for crafts on near zero energy buildings

The Government should also publish an outline schedule of planned construction projects so that the construction sector can prepare for an increase in demand for its labour force. In addition, our education and training sector needs to prioritise the education and training of this skilled workforce and a review of requirements should now take place involving the Department of Education and Skills, Solas, the Department of Housing, Planning and Local Government, the Department of Communications, Climate Change and the Environment and SEAI so as to ensure that the availability of staff does not become a bottleneck that would hamper the delivery of the ambitious targets that have been or will be set for retrofitting.

9.8 Priority recommendations of the Committee

The Committee recommends as follows:

1. The Department of Communications, Climate Action and Environment with the SEAI and the Department of Housing, Planning and Local Government (DHPLG) should urgently carry out a needs assessment in order to determine the requirements for the delivery of the Government's target of retrofitting 45,000 homes per annum from 2021 and explore increasing it incrementally to 75,000 homes. This should include:
    a. Prioritising the categories of houses to be retrofitted with a focus on those with the lowest Building Energy Rating (BER);
    b. For all housing where the State is landlord, the DHPLG should set annual targets for each local authority to deliver deep retrofits of all of its public housing stock by 2030. The DHPLG should allocate necessary finances through the capital budget and explore funding support from the European Investment Bank (EIB).
    c. Producing a plan as a priority by Q3 2019 to meet the training and educational requirements of an enlarged workforce needed to deliver the retrofitting programme (early action in this regard can maximise the associated employment potential and economic, social and environmental benefits). (Sections 9.3, 9.7)
2. The Minister for Housing, Planning and Local Government should provide a road map by Q1 2020 for the decarbonisation of the rental stock by 2030. This road map should include a timescale and associated measures for requiring a minimum C BER for residential lettings. (Section 9.3.3)
3. That the DHPLG revise Parts L and F of the Building Regulations that relate to new builds to set a Nearly Zero Energy Building (NZEB) standard by end 2020. Local authorities should be sufficiently resourced to enforce these regulations. Furthermore, the Committee

recommends that these regulations be revised to stipulate that new buildings should, where possible, be net energy producers to offset older inefficient buildings. (Section 9.4)

4. The Government should include in its all of Government plan on climate action measures for improving the energy performance of all schools, hospitals, and other public buildings, utilising district heating where possible. This should include:
    a. A provision that the installation of new fossil fuel based heating systems are not allowed in public buildings;
    b. a pathway so that all schools shall reach a BER of least B2 by 2030;
    c. a plan to improve energy efficiency and carbon footprints in hospitals;
    d. provision that the Office of Government Procurement facilitates the public sector's retrofitting program by procuring the main energy related investments and services.
    e. All public bodies should produce decarbonisation plans for all their energy use from now to 2050 with a target of 95% decrease in emissions. (Section 9.5)

Chapter 10: Transport

10.1 Introduction

Stabilising and then reducing emissions from the transport sector must be tackled urgently and aggressively if Ireland is to have any hope of reaching our 2030 obligations under the Paris Agreement. Emissions from this sector contribute 20% of our overall GHG emissions with growth in emissions of 140% between 1990 and 2016. Economic growth since 2015 has been closely linked to increased GHG emissions from the sector, and EPA projections between 2017 and 2035 point to an emissions profile, even after accounting for current EV penetration targets and planned public transport investments, in which emissions increase by 13%. On the other hand there are many potential co-benefits of measures to reduce transport emissions for public health (considering both air quality and active mobility), more compact sustainable development, and improved mobility for socially excluded groups.

Solutions are available, many of which remain unimplemented parts of Government policy dating back to 2009.[92] We require a transformation in how citizens and businesses travel on a daily basis. Walking, cycling and public transport must become the default choice for most and that requires infrastructure investments and the provision of safe, fast, frequent, reliable, clean and affordable options. Examples such as the Netherlands and Denmark show that such transformational change is feasible. The State must take the lead in enabling this change. The role of the State must be to make it as easy as possible for people, businesses and organisations to switch to lower carbon lifestyles and business/operational models.

10.2 Citizens' Assembly Recommendations

The Citizens Assembly made three specific recommendations on transport, namely:

R.8: 93% of Members recommended that the number of bus lanes, cycling lanes and park and ride facilities should be greatly increased in the next five years, and much greater priority should be given to these modes over private car use.

R.9: 96% of Members recommended that the State should immediately take many steps to support the transition to electric vehicles.

R.10: 92% of Members recommended that the State should prioritise the expansion of public transport spending over new road infrastructure spending at a ratio of no less than 2-to-1 to facilitate the broader availability and uptake of public transport options with attention to rural areas.

The Committee accepts all three recommendations and this chapter outlines some of the possible pathways to delivering on these recommendations. The Committee acknowledges that the implementation of Recommendation 10 will require investment in public transport on a far greater scale than previously seen in the State.

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[92] Department of Transport. *Smarter Travel, A Sustainable Transport Future, A New Transport Policy for Ireland 2009 - 2020* [online]. Available at: http://www.smartertravel.ie/content/smartertravel-policy-document [accessed on 25.03.2019]

10.3 Current transport policy

SmarterTravel, A Sustainable Transport Future, is the transport policy for Ireland for the period 2009-2020. The policy recognises the vital importance of continued investment in transport to ensure an efficient economy and continued social development, but it also sets out the necessary steps to ensure that people choose more sustainable transport modes such as walking, cycling and public transport. The policy is a response to the fact that continued growth in demand for road transport is not sustainable from a number of angles; it will lead to further congestion, further local air pollution, contribute to climate change, and result in negative impacts to health through encouraging increasingly sedentary lifestyles. The full document sets out the vision, goals and targets of the policy, and outlines the actions that form the basis of achieving a more sustainable transport future. The Committee notes that the targets in Smarter Travel have not been met and recommends that the Department of Transport, Tourism and Sport reviews the policy in time for Budget 2020 and brings forward a new implementation plan that takes account of the recommendations in this Report and that it reports progress to the Standing Committee on Climate Action no later than Q4 of 2019.

10.4 Active transport

Facilitating and encouraging active transport should be the first priority for emissions mitigation in the transport sector. This is due to the important public health benefits achieved through increased physical activity and reduced emissions of, and exposure to, air pollution. Active travel measures are also among the most cost-effective emissions reduction strategies.

While the number of people cycling and walking to their destinations is growing, with commuting to work by bicycle increasing by 43% since 2011, it is difficult to promote active transport when cyclists have to compete with vehicles for road space, and pedestrians are given a lower priority than vehicles. Safety concerns alone will deter a lot of commuters from cycling in particular. Local and national authorities do not, by and large, have a good track record when it comes to putting in infrastructure such as dedicated segregated cycle facilities, and that will have to change. Ireland's first National Cycle Policy Framework was launched in April 2009 and given that many of its recommendations were not implemented, it should now be implemented in line with the recommendations in this Report.

There is a need for greater ambition, through for example, the roll out of dedicated cycle facilities, designed for cyclists of all ages and abilities. The maintenance of cycle facilities must have dedicated funding within the road and local authority budgets to ensure continuity of provision. Local authorities and employers should make provisions for safe and covered parking for bikes. The Committee notes that Dáil Éireann has agreed, in January 2019, to a proposal that all current transport infrastructure programmes should immediately be revised to achieve at least 10% expenditure on facilitating cycling. The Government should respond positively to that proposal.

The Committee welcomes the proposed Government investment under the multi-annual cycling and walking programmes and the possibility of the delivery of 200 km plus of cycle tracks and lanes and pedestrian facilities in Dublin under the BusConnects initiative, with similar BusConnects programmes to be delivered in Cork, Limerick and Galway as part of Project Ireland 2040. The Committee recommends the prioritisation of this proposed investment, commencing in Budget

2020, and encourages identification and funding of additional such projects across the State. Local authorities and the National Transport Authority (NTA) should explore joint opportunities with businesses to fund a widespread regeneration of cycling infrastructure in our cities. The Dublin Bikes scheme shows the potential for such initiatives.

10.5 Future trajectory of transport investment

The Committee notes the intention of the Citizens' Assembly when it called for a change in public investment policy which would favour investment in public transport infrastructure by a ratio of 2 to 1. However it notes that such a ratio is not tailored to adequately guide all transport investment, given that investment in a road can incorporate bus lanes, cycle lanes and footpaths. However, at the same time the Committee agrees that there is an urgent need to rebalance investment towards mass transport solutions, particularly in our congested cities where we must become smarter in our ability to move large numbers of people around efficiently if we are to support further growth opportunities. There will also now be a more comprehensive approach to the way all future projects are evaluated under the revised Spending Code where all investment decisions will fully reflect the social cost of carbon emissions (*Chapter 6, Incentivising Climate Action*). As the population of the State is expected to grow by one million between now and 2050, it is clear that there will have to be a huge shift away from cars if we are not to see ever increasing gridlock. The State should prioritise this shift to public transport and fund the infrastructure development to support it. Project Ireland 2040 includes a significant programme of investment in public transport infrastructure including Metrolink in Dublin, Dart Expansion and Bus Connects for Dublin, Cork, Galway and Limerick among other measures. The Committee supports new public transport infrastructure investment and calls for its speedy delivery as a key enabler of increased public transport usage and reduced use of private transport modes and associated emissions.

The Committee recommends that the public transport elements of Project Ireland 2040 be prioritised and that further public transport projects should also be re-evaluated with a view to their inclusion after the mid-term review of the NDP. The Committee further recommends that the Standing Committee on Climate Action should examine the changes in infrastructure, planning and delivery that would be required to give effect to the 2 to 1 recommendation of the Citizens' Assembly.

The Department of Transport, Tourism and Sport and the NTA should investigate further the range of eco transport technologies that are currently in use, or under development, in other countries such as semi-hybrid solar buses in Norway[93] with a view to identifying opportunities for adaptive retrofit and/or new vehicle introduction into public rolling stock replacements over the coming decade.

10.6 Public and Community Transport

A modal shift away from private cars will not happen unless the public transport alternatives are clean, reliable, frequent and affordable and take people where they need to go. The success of the Luas in Dublin bears testimony to this. However, one of the problems with major public transport

[93] World's First Semi Hybrid Bus with Solar Panels, Available at: https://www.youtube.com/watch?v=ZodPnAVb__o [accessed on 24.03.2019]

infrastructure is the time it takes to deliver major capital projects. It is likely that much of the modal shift in our cities, and particularly in our rural communities, will need to be done through an expanded bus service with improved bus priority. There is a need to encourage the public to take up these public transport alternatives with visible and accessible signage at bus shelters/stops, including timetables, real-time information and promotional campaigns.

10.6.1 Promoting multi-modal transport

The Committee wants to make it as easy as possible for commuters to use services to allow them to combine car, cycling and public transport. This could include improved cycling access routes and cycle parking infrastructure at all stations and the provision of new rural bus services which can carry bicycles. Park and ride facilities for cars are expensive to introduce and require a large land area but are essential in locations where people are making longer commutes.[94] In addition to ensuring that there are adequate park and ride facilities, there is also a need for integrated ticketing so that the train or bus fare includes the parking costs which should be kept to a minimum to encourage uptake. There are many examples of successful schemes elsewhere that can form the basis for development and deployment of improved park and ride facilities e.g. Dutch railway stations and Oxford and Cambridge in the UK.

10.6.2 The need for a national public transport strategy

The Committee acknowledges that the aggregated number of people across the country commuting into and out of towns and cities to work and study[95], is greater than the numbers commuting into and out of Dublin. In this regard, the Committee is concerned that solutions around public transport will be insufficient for many and our national transport strategy must address these issues. The Committee also recognises that demographic trends illustrate that we have an ever increasing older population, and that due consideration must be given to balancing the competing mobility requirements of all citizens.

The Committee believes that the principle of guaranteed access to an integrated national public transport system for all towns and villages is essential to inducing behavioural change on a mass scale. In the context of the Citizens' Assembly recommended significant increase in public transport expenditure, the Committee recommends that the provision of such a guaranteed public transport service for all communities above a certain threshold should be explored. It requests that the Department of Transport, Tourism and Sport examines the approach to public transport which operates in Switzerland[96] and reports their findings to the Standing Committee on Climate Action.

The Committee recommends that the Government should commission the development of regional transport strategies to 2035 to plan for sustainable transport and a modal shift away from vehicle dependency. The Committee notes that, in other countries where significant investment has been made, rail journey times between major centres have been significantly improved. This is an issue that needs to be addressed here and investment is required so that the default choice on basis of

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[94] CSO, 2016. *Commuting: Time & Distance* [online]. Available at: https://www.cso.ie/en/releasesandpublications/ep/p-cp6ci/p6cii/p6td/ [accessed on 23.03.2019]

[95] CSO *Commuting: Workplace Destinations* [online]. Available at: https://www.cso.ie/en/releasesandpublications/ep/p-cp6ci/p6cii/p6www/ [accessed on 23.03.2019]

[96] Mees, Paul, 2009. *Transport for Suburbia: Beyond the Automobile Age.*

time, cost, convenience and comfort becomes public transport for such journeys between our major centres.

The Committee further notes very recent moves to introduce free public transport in some European cities. The topic of provision of free public transport is a matter to which the Standing Committee on Climate Action should hear evidence and come to a view upon.

10.6.3 School journeys

With regard to school transport the Committee acknowledges that a modal shift from private car to bus can play a significant role in reducing large volumes of car journeys but did not as yet hear evidence on this issue from the NTA. The Committee suggests that notwithstanding the review recommended by the Joint Committee on Education and Skills[97] that a more comprehensive piece of work may have to be undertaken to assess the required resources and policies needed to increase the provision and take up of public school transportation.

10.7 Use of private vehicles

10.7.1 Car sharing

There were 2.68 million vehicles registered in the State in 2017 and 48.5 billion vehicle km driven in 2016.[98] Too many car journeys involve single occupants and we have huge problems with congestion. New internet platforms facilitate car sharing, lift sharing and car/bike hire using digital journey planners as examples of shared mobility systems and both save the consumer money and reduce the amount of on-street car parking that is needed in our towns and cities. AS well as this, where possible, the use of dedicated priority lanes with enforcement for multi-occupant vehicles will encourage car sharing.

10.7.2 Traffic management

Prioritising other modes of transport over private cars requires a multi-pronged approach and should include restrictions on access of private cars to our large urban centres, restricting surface and on-street car parking and engaging with the public and private sector bodies around staff car parking. In many European cities for example there has been a lot of success at opening up this space for pedestrians, cyclists and as social and community areas, thus making urban centres safer and more attractive for many.

10.7.3 Eco-driving and speed limits

The Committee heard from the Department of Transport, Tourism and Sport (DTTAS) that there is a study under way with the EPA to examine how eco-driving[99] might be deployed in the most

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[97] https://data.oireachtas.ie/ie/oireachtas/committee/dail/32/joint_committee_on_education_and_skills/reports/2018/2018-11-07_report-on-the-operation-of-the-school-transport-scheme_en.pdf

[98] Department of Transport, Tourism and Sport, 2018. *Transport trends, an overview of Ireland's transport sector 2018* [online]. Available at: http://www.dttas.ie/sites/default/files/publications/corporate/english/transport-trends-2018/transport-trends-2018.pdf [accessed on 06.02.2019]

[99] Committee hearing with DTTAS, 4 October 2018. Available at: http://www.together-eu.org/docs/102/TOGETHER_Eco-driving_5_Handout_15.pdf [accessed on 23.03.2019]

efficient and effective way to reach the target audience and that eco-driving should be encouraged as an immediate mitigation strategy for all drivers. The introduction of variable speed limits and the reduction of top speed limits on motorways have significant mitigation potential. The DTTAS and EPA should send their findings on eco-driving to the Standing Committee on Climate Action once the study is finished.

10.7.4 Electric Vehicles (EVs)

52% of all transport emissions come from private cars and the switch from internal combustion engines to Electric Vehicles (EVs) will be key to reducing emissions in the private car fleet. In future, emerging technologies such as hydrogen powered cars may become economically viable and the Standing Committee on Climate Action should remain appraised of such developments. Switching to an EV can be an important way for citizens to participate in reducing their personal carbon footprint. There are currently approximately 6,500 EV's on Irish roads and while this is low, the pace of take-up is accelerating and the Committee was told that the sale of EVs had doubled in 2018. The likelihood is that this will increase significantly in the years ahead as the price of EV's comes down and the range of models available increases. The Committee notes that while some car manufacturers have indicated that they will no longer make petrol and diesel cars, the market has still to readjust and there can be delays in getting an appropriate supply of EVs to meet demand. The Committee recommends the continuation of incentives to encourage early adopters, including the SEAI purchase grants, Vehicle Registration Tax (VRT) rebates and offering motor tax and road toll exemptions, subject to the qualifications given in Chapter 6, *Incentivising Climate Action*, in relation to grants versus low cost loans. As the cost of EVs is expected to fall, we should expect a corresponding increase in the sale of EVs. Therefore it is likely that at some point in the future the current incentive package will no longer be needed or affordable.

The Committee notes the poor uptake on the DTTAS €2.5 million Green Public Transport Fund, which was established to assist buses and taxis to switch from diesel and petrol to low-emission alternatives. In 2018 there were 20,000 taxi, hackney and limousine (small public service vehicles or SPSVs) in Ireland (50% of them in Dublin). While SPSVs are only responsible for a small portion of Ireland's transport GHG emissions, electrifying Ireland's SPSV's would instil public awareness and confidence in EVs as well as helping to reduce noise and improve air quality in urban centres. The NTA offers a purchase grant for electric SPSV's but better incentives as recommended by the Low Emissions Vehicles Taskforce would help.[100] Drivers of SPSV's have the potential to be significant advocates for change in our car purchase habits. The sector is also generally represented by self-employed drivers and providing extra help to this group would also address aspects of the Just Transition for this group who may otherwise be substantively affected by carbon pricing changes.

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[100] Government of Ireland, 2018. *Low emissions vehicles taskforce progress report, September 2018* [online]. Available at: https://www.dccae.gov.ie/en-ie/energy/publications/Documents/21/LEV%20Taskforce%20Phase1%20Progress%20Report.pdf [accessed on 07.02.2019]

The Committee notes that existing EV policy has focussed on heavy vehicles with long ranges. It notes the potential of lightweight EVs such as the electric cargo tricycles recently put in operation by An Post and recommends that policies to encourage EVs should encourage a wider range of vehicles.

As the numbers of EVs rise in Ireland, the impacts of the management of lithium batteries as they reach the end of their lives needs to be considered by the Department of Transport, Tourism and Sport in order to minimise the risk of environmental pollution in the future. It is critical that planning for how to deal with this issue begins now so that all required facilities and protocols are in place well in advance. This strategy should involve attempts to recycle, to the greatest extent feasible, the raw materials in the batteries. As well as this, petrol and diesel cars will need to be taken off the roads in coming years. A comprehensive strategy must be put in place by the DTTAS to manage end-of-life petrol and diesel cars and EV batteries.

10.7.5 EV charging network

Although the distance EVs can travel per charge is improving and the standard range is now sufficient, range anxiety remains a deterrent to EV uptake. The Committee was informed about the need for investment in an extensive recharging network to encourage motorists to make 'the switch' as recommended by the Citizens' Assembly. It welcomes the €10 million in funding provided to the ESB under the Climate Action Fund to upgrade and expand the national charging network with additional fast charging hubs in 2019. While it is anticipated that most people will charge their EVs at home, continued and increased investment in upgrading and extending the public fast-charging network is vital to alleviate range anxiety and accelerate EV growth. This should include provision of fast charging points at the premises of taxi firms and major stands of SPSVs to encourage their uptake.

The Committee recommends that the Department of Communications, Climate Action and Environment expedite the rollout of public charging points starting in 2019. The Department should also address access of those who live in apartments or in terraced housing where home charging is not possible. The Committee welcomes the initiatives taken by many enterprises to have charging points in their carparks for staff and for customers.

The Committee recommends that by September 2019 the Government should report on ways, through the planning system and regulation, to ensure that new and existing buildings install adequate EV points along with cycle parking facilities. As part of this, the Committee recommends that businesses (e.g. supermarkets and shopping centres) that have large car-parking facilities should be required to dedicate a portion of space for EV charging.

10.8 Emissions standards for buses and trucks

Electrifying, improving, and extending public transport, as well as making it cheaper to use, can all help increase the number of citizens using this mode of transport. The Committee heard from the Department of Transport, Tourism and Sport of the continued improvement of the bus fleet and future policies including committing to not buying any more diesel only buses from mid-2019. The State needs to show leadership in this area and should move quickly to remove older buses from the fleet. The Committee recommends that all new buses purchased henceforth by the

State/relevant public bodies should be low (and ideally zero) emission vehicles and diesel buses should be phased out of the fleet as soon as practicable.

Heavy Goods Vehicles (HGVs or trucks) account for 26% of transport emissions and the reduction in emissions from freight calls for a longer term plan. There has been progress in improving the carbon efficiency of HGVs though the "Euro Standard 6". This is the latest European emissions standard for buses and HGV's which requires high standards for air pollutants, trapping particulate matters and nitrogen oxides. Long term, the move to having HGVs run on either hydrogen, liquefied petroleum gas (LPG - the LPG refuelling network already exists) or compressed natural gas (CNG) appears to offer the most advantageous pathway. With funding from the European Causeway Project, Gas Networks Ireland (in conjunction with NUI Galway) announced plans to roll out a network of 70 CNG refuelling stations to service trucks, vans and buses on our motorways.[101] As a part of this, the Committee heard that 14 publicly available CNG refuelling stations should be open by 2020.[102] The CNG network can be supplied with natural gas from the current gas network infrastructure and in the future renewable biogas can be introduced to Natural Gas Vehicles (NGVs) without further conversion. Greater use of natural gas and biogas instead of diesel or petrol can help reduce GHG emissions from the bus fleet and HGV sector. More detailed research work needs to be done on what volume of biogas can be delivered on a sustainable basis (Chapter 8, *Agriculture, Forestry and Peatlands*).

10.9 The role of biofuels

The EU Biofuels Obligation Scheme, which requires blending biofuel into our petrol and diesel, is reducing GHG emissions. The Committee notes the current trajectory which will have seen biofuel obligation rates increase from 8.7% in 2018 to 11.1% (by volume) from 1st January, 2019[103] and the likelihood is that it could increase to 12% thereafter, although the Committee understands that this could cause technical problems for some petrol and diesel cars. As the blending is done at refinery level, the process has been described as an 'invisible' policy measure from the perspective of the consumer. Concern at EU level about undesired land use effects and impacts on food security from the production of biofuel has led to the dropping of renewable energy targets for transport from 2020 onwards. The State will have to review the source and sustainability of such fuel supplies in light of increasing concern about the sustainability and impacts of biofuel production.

10.10 Other transport modes

The Committee did not hear evidence on the potential for emissions reduction in the freight sector and from the greater use of our inland waterways and recommends that the Standing Committee

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[101] O'Sullivan, K., 2018. *Network of 70 compressed natural gas filling stations announced.* Irish Times. 3 January [online]. Available at: https://www.irishtimes.com/business/transport-and-tourism/network-of-70-compressed-natural-gas-filling-stations-announced-1.3343964 [accessed on 07.02.2019]

[102] Committee hearing with the DTTAS, 4 October 2018. Transcripts available at: https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_climate_action/2018-10-04/debate/mul@/main.pdf [accessed on 24.03.2019]

[103] NORA, n.d. *Biofuels obligation scheme* [online]. Available at; http://www.nora.ie/biofuels-obligation-scheme.141.html [accessed on 07.02.2019]

on Climate Action include analysis of emissions from the freight and waterways sectors in its work in 2019.

The Committee notes that Ireland has no rail freight subsidies or grants unlike other European countries. The Standing Committee on Climate Action should evaluate the potential role of rail subsidies to enable more efficient freight transport, especially in light of the development of automated container transfer technology.

The Committee also did not consider aspects around international travel by air and sea. Both are major sources of emissions that are not accounted for in Nationally Determined Contributions under the Paris Agreement. Ongoing international negotiations on both aviation and shipping continue.[104] The Standing Committee on Climate Action should consider further these aspects recognising that their regulation necessarily has an international context.

10.11 Priority recommendations of the Committee

The Committee notes that transport is a complex problem to address and that substantial further investigation shall be required by the Standing Committee, the Climate Action Council and the Government as part of the all of government approach. The Committee in accepting the recommendations of the Citizens' Assembly makes the following initial recommendations:

1. The urgent delivery of proposed investment under Project 2040 and other programmes in low-carbon and zero-carbon modes of transport including major public transport infrastructure works, commencing in 2019 and calls for these and additional similar projects to be prioritised and expanded. (Section 10.5)
2. That the DTTAS review and bring forward a revised implementation plan for the outstanding policies and actions in its existing 2009-2020 policy Smarter Travel, *A Sustainable Transport Future* in time for Budget 2020 (Section 10.3)
3. The DTTAS, together with local authorities, should commence the full implementation of *the National Cycle Policy Framework* by 2020. In particular,
    i. Every local authority should set forth a clear pathway and timetable for the installation of dedicated cycling infrastructure, where lanes are kerb segregated where possible, in all urban areas;
    ii. the DTTAS should also significantly increase funding in dedicated cycling infrastructure;

    In addition, in line with the motion of the Dáil on Promoting Cycling approved on 17th January, 2019, all current transport infrastructure programmes should immediately be revised to achieve at least 10% expenditure on facilitating cycling. (Sections 10.3, 10.4)

4. All cities with a population exceeding 75,000 should produce a sustainable transport plan (or a revised plan where one is already in existence) by no later than June 2020 for review by the NTA and DTTAS. In particular, all plans should:
    i) be in line with emissions reductions for 2021-2025 consistent with the first carbon budget (see Chapter 1);

[104] IATA, n.d. *Carbon offsetting for international aviation (CORSIA)* [online]. Available at: https://www.iata.org/policy/environment/Pages/corsia.aspx and The Maritime Executive, 2018. *The IMO agrees to carbon targets* [online]. Available at: https://www.maritime-executive.com/article/imo-agrees-to-co2-emissions-target [both accessed on 26.03.2019]

ii) provide for a significant shift from private vehicle and road freight use, to intermodal solutions which include bus, rail, cycling and waterways; and
iii) integrate all public transport modes, community transport schemes, private transport operations and lift-sharing schemes.

The Government must ensure that the sustainable transport plans and associated investment decisions are consistent with the Smarter Travel policy and that a dedicated multi annual budget be provided for the respective sustainable transport plans. (Sections 10.3, 10.4, 10.6)

5. There is a need for fast, frequent, cheap and reliable public rail connections between our major urban centres. In that regard, a rail infrastructure capacity review is needed and the DTTAS and Iarnród Éireann are requested to provide a strategy paper outlining all feasible options and associated investment implications by September 2019 to the Standing Committee. (Section 10.6)

6. The DTTAS, with other relevant Departments and agencies, should undertake a review of policy to expand the rural transport programme to include all transport modes to provide integrated public transport and shared mobility solutions[105] for all rural areas together with local authorities. This review should lead to a new rural transport strategy which should:
    a. include a comprehensive assessment of rural travel demand, and methodologies for determining same;
    b. set a target for modal shift and emissions reductions for 2021-2025 consistent with the first Carbon Budget (see Chapter 1);
    c. proposals for an integrated public transport network (to include Local Link, Bus Éireann, private bus operators and the school bus service) with all ancillary services (park and ride, bike hire, EV charging, lift sharing etc.) to be completed no later than 2030 with a view to providing comprehensive linked services for all rural areas; and
    d. develop a pilot scheme for a city and its regional hinterland to develop a best practice model. (Section 10.6)
7. There is a need to better support the transition to zero emission vehicles. In this regard the following actions are required:
    a. The Department of Communications, Climate Action and Environment should accelerate the roll-out of a national fast-charging network aided by the Climate Action Fund and there should be a more ambitious roll out of EV charging infrastructure in accordance with the planned increases in EV numbers by 2030.
    b. In order to encourage early adoption in a cost effective manner, the SEAI and DTTAS should ensure regular reviews of the need for existing grants, incentives and supports available for EVs (subject to the qualifications given in Chapter 6 in relation to grants versus low cost loans purchase) and examine the possibility of scrappage support for petrol and diesel vehicles. These reviews should include consideration of supporting or encouraging small and lightweight EVs including electric bicycles, tricycles, cargo bikes and small cars. (Section 10.7)

[105] Shared mobility solutions include lift-sharing, shared taxis and minibuses, utilising digital platforms to connect people such as https://www.blablacar.co.uk/ride-sharing-abroad/fr/ in France for example.

Appendices

Appendix 1: Terms of Reference

The Special Committee on Climate Action was established in July 2018 to respond to the recommendations set out in the Third Report of the Citizens' Assembly, *Making Ireland a leader in tackling climate change.* The Committee is charged with:

- Considering the Third Report of the Citizens' Assembly, in particular, how their recommendations might inform the further implementation of Irelands National Mitigation Plan (NMP) and the development of the draft National Climate and Energy Plan (NECP) while taking the National Development Plan (NDP) into consideration;
- Engaging with the Secretaries General of the relevant Government Departments to assess the state of play of their Sectoral Adaptation Plans and to consider their mitigation measures and how these can contribute to the further implementation of the NMP and the development of the draft NECP while taking the NDP into consideration;
- Considering such other related matters and engaging with other relevant stakeholders as the Committee sees fit; and
- Publishing a report on their conclusions and recommendations by 28th March 2019[106].

The goal of the Committee is to identify and recommend key mitigation and adaptation measures in the form of concrete actions that can successfully put Ireland on an efficient pathway towards reaching our European and international greenhouse gas (GHG) emissions targets and achieving the national goal of decarbonisation by 2050. Actions have been identified through the consideration of, among other things:

- The Citizens' Assembly Third Report and its recommendations;
- National Mitigation Plan;
- National Adaptation Framework;
- National Development Plan;
- Climate Change Advisory Council (CCAC);Evidence provided during Module 1 Committee meetings with other relevant stakeholders;
- Evidence provided during Module 2 Committee meetings with the Secretaries General of the relevant Departments;
- Information provided by the expert advisor to the Committee; and;
- Any other relevant information provided by the expert advisor to the Committee.

The report will be based on the information set out above as well as any other relevant information in the public domain.

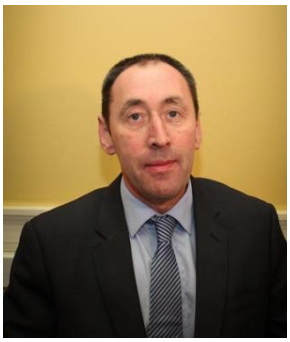
[106] The date was confirmed by an order made by the Dáil and the Seanad on 13th March, 2019.

Appendix 2: Membership of Joint Committee on Climate Action

Deputies:	Mary Butler TD (FF)
	Jack Chambers TD (FF)
	Marcella Corcoran Kennedy TD (FG)
	Pat Deering TD (FG)
	Timmy Dooley TD (FF)
	Martin Heydon TD (FG)
	John Lahart TD (FF)
	Imelda Munster TD (SF)
	Hildegarde Naughton (FG)
	Tom Neville TD (FG)
	Carol Nolan TD (RIG)
	Thomas Pringle TD (I4C)
	Eamon Ryan TD (SD-GP)
	Seán Sherlock TD (Lab)
	Bríd Smith TD (Sol-PBP)
	Brian Stanley TD (SF)
Senators:	Paul Daly (FF)
	Máire Devine (SF)
	Tim Lombard (FG)
	Ian Marshall (Ind)
	Michelle Mulherin (FG)
	Grace O'Sullivan (CEG)

Notes

1. Deputies nominated by the Dáil Committee of Selection and appointed by Order of the Dáil on 3 July 2018.
2. Senators nominated by the Seanad Committee of Selection and appointed by Order of the Seanad on 5 July 2018.
3. Paul Murphy TD (Sol-PBP) replaced by Bríd Smith TD (Sol-PBP) October 2018.

 **Mary Butler T.D. (FF)**	 **Jack Chambers T.D. (FF)**	 **Marcella Corcoran Kennedy T.D. (FG)**	 **Pat Deering T.D. (FG)**
 **Timmy Dooley T.D. (FF)**	 **Martin Heydon T.D. (FG)**	 **John Lahart T.D. (FF)**	 **Imelda Munster T.D. (SF)**
 **Hildegarde Naughton T.D. (FG) [Chair]**	 **Tom Neville T.D. (FG)**	 **Carol Nolan T.D. (RIG)**	 **Thomas Pringle T.D. (I4C)**

			
Eamon Ryan T.D. (SD-GP)	**Seán Sherlock T.D. (Lab)**	**Bríd Smith T.D. (Sol-PBP)**	**Brian Stanley T.D. (SF)**
			
Senator Paul Daly (FF)	**Senator Máire Devine (SF)**	**Senator Tim Lombard (FG)**	**Senator Ian Marshall (Ind)**
			
Senator Michelle Mulherin (FG)	**Senator Grace O'Sullivan (CEG)**		

Appendix 3: Recommendations of the Citizens' Assembly

Under the Terms of Reference, the Committee must consider the Third Report of the Citizens' Assembly. The Citizens' Assembly made 13 Voted Recommendations and four Ancillary Recommendations.

The 13 Voted Recommendations were as follows:

i. 97% of the Members recommended that to ensure climate change is at the centre of policy-making in Ireland, as a matter of urgency a new or existing independent body should be resourced appropriately, operate in an open and transparent manner, and be given a broad range of new functions and powers in legislation to urgently address climate change.

ii. 100% of the Members recommended that the State should take a leadership role in addressing climate change through mitigation measures, including, for example, retrofitting public buildings, having low carbon public vehicles, renewable generation on public buildings and through adaptation measures including, for example, increasing the resilience of public land and infrastructure.

iii. 80% of the Members stated that they would be willing to pay higher taxes on carbon intensive activities, subject to the qualifications identified in the question.

iv. 96% of the Members recommended that the State should undertake a comprehensive assessment of the vulnerability of all critical infrastructure (including energy, transport, built environment, water and communications) with a view to building resilience to ongoing climate change and extreme weather events. The outcome of this assessment should be implemented. Recognising the significant costs that the State would bear in the event of failure of critical infrastructure, spending on infrastructure should be prioritised to take account of this.

v. 99% of the Members recommended that the State should enable, through legislation, the selling back into the grid of electricity from micro-generation by private citizens (for example energy from solar panels or wind turbines on people's homes or land) at a price which is at least equivalent to the wholesale price.

vi. 100% of the Members recommended that the State should act to ensure the greatest possible levels of community ownership in all future renewable energy projects by encouraging communities to develop their own projects and by requiring that developer-led projects make share offers to communities to encourage greater local involvement and ownership.

vii. (a) 97% of the Members recommended that the State should end all subsidies for peat extraction and instead spend that money on peat bog restoration and making proper provision for the protection of the rights of the workers impacted; and (b) 61% recommended that the State should end all subsidies on a phased basis over 5 years.

viii. 93% of the Members recommended that the number of bus lanes, cycling lanes and park and ride facilities should be greatly increased in the next five years, and much greater priority should be given to these modes over private car use.

ix. 96% of the Members recommended that the State should immediately take many steps to support the transition to electric vehicles.

x. 92% of the Members recommended that the State should prioritise the expansion of public transport spending over new road infrastructure spending at a ratio of no less than 2-to-1 to facilitate the broader availability and uptake of public transport options with attention to rural areas.

xi. 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.

xii. 93% of the Members recommended the State should introduce a standard form of mandatory measurement and reporting of food waste at every level of the food distribution and supply chain, with the objective of reducing food waste in the future.

xiii. 99% of the Members recommended that the State should review and revise supports for land use diversification with attention to supports for planting forests and encouraging organic farming.

The four Ancillary Recommendations were as follows:

I. Greater emphasis should be placed on providing positive information to the public which encourages people to make changes to the aspects of their behaviour which impact on climate change. Such information should be targeted at all age groups using a wide variety of formats. The information provided should be focussed on highlighting the economic, social, health and other benefits of taking action rather than focussing on the negatives associated with a failure to act.

II. Steps should be taken to reduce packaging, particularly plastic packaging, and resulting waste. Suggestions for such steps include the eradication of single use plastics particularly in supermarkets and the imposition of penalties for failure to comply and the introduction of a deposit return scheme on plastic bottles.

III. The agriculture sector in Ireland requires ongoing support to make a transition towards models of production which give rise to lower GHG emissions. Cognisance must be taken of the impact which the sector has on the economy, particularly the rural economy.

IV. All new buildings should have a zero or low carbon footprint and planning permission should only be granted for new builds which comply with these requirements. The government should provide incentives to retrofit homes to achieve better energy efficiency ratings.

Appendix 4: Public meeting list of witnesses and links to transcripts

5 September 2018	• Ms. Justice Mary Laffoy, Chair, Citizens' Assembly • Ms. Gráinne Hynes, Deputy Secretary, Citizens' Assembly • Economic and Social Research Institute (ESRI) • Transcript Available Here
12 September 2018	• Climate Change Advisory Council • Environmental Pillar • Transcript Available Here
20 September 2018	• Director General (DG) Energy of the European Commission • Transcript Available Here
26 September 2018	• Sustainable Energy Authority of Ireland (SEAI) • Secretary General, Department of Communications, Climate Action and Environment • ESB • Transcript Available Here
02 October 2018	• UK Met Office • Transcript Available Here
04 October 2018	• Secretary General, Department of Transport, Tourism and Sport • National Transport Authority • Transcript Available Here
10 October 2018	• Secretary General, Department of Housing, Planning and Local Government • Transcript Available Here
18 October 2018	• Secretary General, Department of Business, Enterprise and Innovation • Enterprise Ireland • Irish Development Authority (IDA) • Science Foundation Ireland (SFI) • Transcript Available Here
24 October 2018	• Secretary General, Department of Rural and Community Development • The Office of Public Works (OPW) • Transcript Available Here

7 November 2018	• Secretary General, Department of Agriculture, Food and the Marine • Teagasc • Bord Bia • Transcript Available Here
13 November 2018	• Bord Na Móna • EirGrid • Transcript Available Here
14 November 2018	• Secretary General, Department of Public Expenditure and Reform • Secretary General, Department of Finance • Transcript Available Here
21 November 2018	• Professor Valérie Masson–Delmotte • Professor Sonia Seneviratne • Dr. Pierre–Marie Aubert • Transcript Available Here
4 December 2018	• Irish Congress of Trade Unions • Nevin Economic Research Institute (NERI) • Services Industrial Professional Technical Union (SIPTU) • UNITE • Transcript Available Here
5 December 2018	• Richard Bruton TD, Minister for Communications, Climate Action & Environment • Transcript Available Here
12 December 2018	• Marine and Renewable Energy Ireland (MaREI) Centre • Teagasc • Irish Farmers' Association (IFA) • The Irish Creamery Milk Supplier Association (ICMSA) • The Irish Cooperative Organisation Society (ICOS) • Irish Natura and Hill Farmers Association (INHFA) • Transcript Available Here
19 December 2018	• Commission for Regulation of Utilities (CRU) • Lord Deben(Chairman) and Chris Stark (Chief Executive) UK Committee on Climate Change (CCC) • Transcript Available Here

16 January 2019	• MET Éireann • RTÉ • Macra na Feirme • Transcript Available Here

Appendix 5: List of all Priority and Ancillary Recommendations

Priority recommendations of the Joint Committee on Climate Action

The following comprises a list of priority recommendations made by the Committee as a result of its deliberations. The priority recommendations are also found at the end of each Chapter they relate to and the section where each recommendation arises from is also referenced.

Chapter 1: The need for a new national framework (Section 1.7)

The Committee recommends that a new governance framework be established for delivering on climate action, and in that regard it recommends that:

1. New climate change legislation be enacted by the Oireachtas in 2019 that will include, with regard to a new governance structure:
    a) That action on climate should be considered a priority activity across all of Government;
    b) The establishment of a new Climate Action Council to supersede the Climate Change Advisory Council;
    c) The establishment of a Standing Committee of both the Houses of the Oireachtas on Climate Action;

    And with regard to mitigation targets and performance:
    d) A target of net zero economy-wide emissions by 2050;
    e) A provision for a 2030 emissions target, consistent with the emissions reduction pathway to the 2050 target, to be set by 2020 by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council;
    f) Provision for five-yearly carbon budgets[107], consistent with the emissions reduction pathway to 2030 and 2050 targets, to be set by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council;
    g) A target for the renewable share of electricity generation of at least 70% by 2030; and
    h) Strengthening the statutory obligation on public bodies to require that they perform their functions in a manner consistent with the 2050 target and interim targets. (Sections 1.3 and 1.4)

2. A stronger mandate, expanded secretariat and budget be should be given to the Climate Action Council.[108] That mandate shall include the responsibility for developing and proposing five-yearly carbon budgets. The legislation should ensure:
    a) that the board of the Council has a mix and balance of both gender and expertise; and
    b) the Council be given access to the data and expertise held by Government Departments. (Section 1.4.2)

3. The Standing Committee of both Houses of the Oireachtas on Climate Action should:
    a) hold Ministers and public bodies to account for their climate action performance;
    b) examine selected public policy proposals for climate implications; and

[107] Carbon budgets will set a ceiling of emissions in millions of tonnes of Carbon dioxide equivalent (CO_2-eq)

[108] The Climate Action Council should continue momentum to date by on climate action so as to benefit from work to date by that body.

c) Report annually to both Houses of the Oireachtas on the performance of the State in meeting its obligations (Section 1.4.3)

4. A coherent all of government approach, supported by the Climate Action Implementation Board, should be adopted for the delivery and management of climate actions. The central coordination and performance oversight role should be mandated to the Department of the Taoiseach (Section 1.5).

Chapter 2: Supporting a Just Transition (Section 2.6)

The Committee recommends:

5. A Just Transition Task Force be established in 2019 to proactively consider the likely upcoming challenges of the forthcoming rapid transition to a low carbon economy. The Task Force should have an independent Steering Committee and Chair and will involve workers and their unions, employers, communities, farmers, Government and civil society to plan the detail of delivering security and opportunity for workers.[109] The Task Force should be invested with the requisite authority and resources, including a specialist mediation service and the facility to draw on expertise as needed. The Task Force shall:
   - commission research in 2019 examining which regions and sectors of the economy are most likely to experience serious disruption over the next decade as part of our transition to a low carbon economy;
   - Address the need for sound investments in low-emission and job-rich sectors and technologies by:
     a) Carrying out early assessments of the social and employment impacts of climate policies;
     b) Addressing training and skills development;
     c) Identifying social protection needs in the changing industries, along with active labour market policies; and
     d) Developing local economic diversification plans that support decent work and provide community stability in the transition.

   The implementation of agreed interventions for transition, as developed in the framework, should involve a partnership approach involving Government, employers, farmers, trade unions and civil society (Section 2.4).

6. With regards to the immediate need to address the ongoing transition in the Midlands region, the Government should direct as soon as possible in 2019:
   a) The Midlands Regional Enterprise Plan (REP) Committee to devise a Midlands Just Transition Strategy, in order to sustain the economic and social fabric of the region in a post peat extraction era. The strategy should make provision for specific funding, to finance amongst other things, a major project to rewet denuded peatlands in the Midlands. This should start with the peatlands owned by Bord na Móna;
   b) Bord na Móna to undertake a review of the employment potential of deploying its current workforce into a peatlands restoration project for its landholding. This

[109] This should be based on the ILO *Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All.*(ILO, 2015)

review should also outline the full cost of such a project and contain an assessment of the carbon impact of creating a carbon sink; and

c) The SEAI to examine how best to deliver a major house retrofitting programme in the Midlands (Section 2.5)

Chapter 3: Citizen and Community Engagement (Section 3.6)

The Committee recommends:

7. The Department of Communications, Climate Action and Environment should enable each local authority to establish or designate a Climate Change Strategic Policy Committee (SPC), to be incorporated into the SPC schemes for each local authority after June 2019. External representation on this SPC should be inclusive of all social, economic and environmental stakeholder groups. (Section 3.3)

8. The Department of Communications, Climate Action and Environment should enable each local authority, individually or jointly, to establish a one-stop-shop or other suitable structure, with appropriate resources and expertise.[110] This should provide practical advice to households and businesses on significantly reducing GHG emissions and utilise information and advice from the SEAI and the Climate Action Regional Offices. This one-stop-shop must include a strategy for reaching out to all communities by the end of 2020 (Section 3.3).

Chapter 4: Education and Communication (Section 4.5)

The Committee recommendations:

9. The Department of Education and Skills should by the end of 2019, in consultation with the National Council for Curriculum and Assessment (NCCA) and other relevant experts, review the curriculums for primary and secondary education for coverage and accuracy to ensure that students are fully literate on climate change and its potential impact. (Section 4.3.1)

10. Government Departments as part of the all of government approach to climate change should, before the end of 2019, develop and launch public information campaigns on the need to take action to address climate change, challenges and opportunities. (Section 4.4.1).

11. The Broadcasting Authority of Ireland should, by the end of 2019, develop guidelines and measures to encourage and facilitate climate change broadcasting and on-demand service distribution to ensure comprehensive and accurate coverage of climate change. (Section 4.4.2)

12. That Met Éireann takes a more proactive role as the trusted source in weather forecasting to, where scientifically justified, link specific events to climate change. Furthermore, Met

[110] Refer to the Tipperary Energy Agency as a good model of a one-stop-shop type structure

Éireann should consistently reflect the scientific consensus represented by the IPCC. To this end, the Department of Housing, Planning and Local Government should resource a dedicated Climate Communications Section within Met Éireann. (Section 4.4.3)

Chapter 5 Unlocking potential (Section 5.8)

The Committee recommends:

13. Developing climate change solutions represents an opportunity to show leadership and to progress economic and social opportunities. Starting with the budget for 2020, a program of substantial R&D investments should be instigated focusing upon developing solutions to climate change. Priority should be given to those areas / technologies where there is the greatest potential for mitigation and adaptation. (Section 5.3.1)

14. The Department of Health should carry out a review of the health risks associated with climate change and benefits associated with climate action. The results of this review and the preliminary report on the Warmth and Wellbeing Scheme should both be published by June 2019. Following this publication, if the evidence supports it, the HSE and DCCAE should bring forward a proposal on a national roll-out of the Warmth and Wellbeing Scheme. The Minister for Communications, Climate Action and Environment and the Minister for Health should report their progress on these matters to the Standing Committee on Climate Action no later than end Q2 2019. (Sections 5.6, 5.7)

Chapter 6: Incentivising Climate Action (Section 6.7)

The Committee recommends a suite of measures to incentivise climate action by citizens, businesses, and the State. Specifically it recommends:

15. All large planned and new public infrastructure projects should be priced for their climate impact using the revised shadow price of carbon. This should include:
    a) An appraisal of the climate mitigation impact of all planned and new public infrastructure projects as part of the cost benefit analysis that is necessary for Government approval; and
    b) An assessment of the climate mitigation impact and potential of Project Ireland 2040 should be completed by the Delivery Board for the National Development Plan and reported to the Climate Action Council and to the Standing Committee on Climate Action. (Sections 6.3 and 6.4)

16. That the Government undertakes a thorough review of the current financial support mechanisms for citizen engagement in the climate transition. This review must consider those citizens who can reasonably be expected to co-pay or repay (partially or in full), and those who should be fully supported. The review should consider both the efficacy and possibility to extend existing grant schemes, and the possibility of various models of innovative State-backed low-interest long-term loan schemes as employed elsewhere in Europe. This review should be completed by Budget 2020 such that the improved range of opportunities for citizen engagement be made available in tandem with planned increases in the carbon price (Section 6.5).

17. In response to the Citizens' Assembly recommendation that the level of carbon taxation should be increased, the Committee -
    - Acknowledges the expert advice in favour of this measure from the Climate Change Advisory Council and the ESRI.
    - Strongly supports the Citizens' Assembly emphasis on protecting those on low incomes.
    - Recognises that the introduction of increases in carbon pricing will have differing, and potentially negative impacts, on certain sections of society without the initial implementation of commensurate protective measures.
    - Accepts international consensus on the significant role of carbon taxation in supporting the needed behavioural and investment change away from fossil fuels and to this end, acknowledges that a carbon price trajectory to €80/t by 2030 would play an important role in the State's response to climate change.
    - Emphasises that carbon pricing should not be viewed as a solitary solution, but rather a component of a comprehensive package in which Government takes the lead on cutting emissions and making less polluting choices affordable and accessible for citizens.
    - Agrees that the proceeds from carbon pricing should be ring-fenced in legislation to ensure this does not go into general Exchequer funding.

    In view of the above:

    That the Minister for Finance should set out a carbon price trajectory that rises to €80 per tonne by 2030, and this should only be implemented when an evidenced-based plan is in place to increase supports and incentives for climate action measures, including the protection of those vulnerable to fuel poverty.

    The Government should, prior to the introduction of any increase in carbon taxation, examine the impacts on low-income families and on the basis of these findings, introduce specific policy measures to assist those who may not be in a position to immediately transition from fossil fuels, including the potential use of social protection mechanisms, such as tax credits and welfare payments.

    Starting immediately upon publication of this report -

    a) The Government should conduct a review to be completed by June 2019 into the most appropriate measure of, and the extent and nature of fuel poverty across all cohorts and to include in this review the short, medium and long-term impact on fuel poverty of the options for increasing the carbon tax.

    b) The Department of Finance and DPER should initiate a public consultation with citizens, communities and relevant sectors including small businesses, NGOs and other relevant organisations to invite views on the optimal way to fairly allocate the hypothecated revenue from the proposed increase in carbon tax (see section 6.6.3).

    This consultation should cover the use of revenue for:

    i. protection of those in fuel poverty and for specific climate actions; and/or

ii. a 'Fee and Dividend' approach.

It should also invite views on ways to mitigate impacts on low income households, small businesses and community enterprises/not for profit organisations that do not have ready access to low-carbon alternatives. The Climate Action Council should contribute to this consultation, by drawing on relevant national expertise and engagement with similar bodies in other jurisdictions. This consultation should start as soon as possible, and within six weeks of the publication of this report.

The outcomes of the public consultation and the fuel poverty review, should form the basis for a draft policy paper to be prepared by the DCCAE jointly with the Department of Finance and DPER and submitted before the end of July 2019 to the Standing Committee on Climate Action. This draft policy paper should address the findings of the fuel poverty review at (a) and the consultation at (b).

The Standing Committee on Climate Action should then respond to this policy paper and be given the opportunity to develop a consensus position on how to allocate revenues to 2030 prior to Budget 2020.

18. The Committee recommends that the Department of Finance commission an enquiry into the revenue that could be realised through the introduction of a carbon tax on the profits of corporations and firms directly linked to the production and sale of gas, oil, coal and other fossil fuels. That enquiry should also look at the revenue that could be realised from the imposition of a carbon tax on the profits of other corporations and firms linked to high usage of fossil fuels including aviation, shipping etc.

Chapter 7: Energy (Section 7.9)

The Committee recommends the following:

19. Rapid development and deployment of offshore wind energy is critical if we are to meet our international emissions reduction obligations. To this end, the Government should:
    a) Bring forward the *Maritime Area and Foreshore (Amendment) Bill* with a view to its enactment by the end of 2019 ensuring that the development of offshore wind is prioritised;
    b) In parallel, the Department of Communications Climate Action and Environment should carry out a full review of the *Offshore Renewable Energy Development Plan* by January 2020; and
    c) To inform this review, the Climate Action Council should advise the Department on an appropriate and ambitious target for deployment of offshore wind capacity by 2030 consistent with national emissions targets. (Section 7.4.1)

20. The Government should prioritise the transposition and implementation of recent EU directives (the revised Renewable Energy Directive which is accompanied by the Energy Efficiency Directive) that will require broader scale adoption of renewables including onshore wind and solar. It is important to do so in a socially acceptable manner, and in particular by removing barriers that are impeding its development. The Committee specifically recommends that:

a) No later than 1 September 2019, the Department of Housing, Planning and Local Government update and publish new Wind Energy Development Guidelines,
b) Prepare guidelines if necessary for large scale solar energy farms;
c) The Department of Communications, Climate Action and the Environment should commission independent research in those areas where new wind energy infrastructure has been constructed to investigate the precise grounds and concerns which have provoked resistance and take the necessary steps to address them; and
d) The Department of Communications, Climate Action and Environment should engage with the Standing Committee on Climate Action on the detailed design of the RESS auctions before it is finalised, to ensure that community benefits and investment are both mandatory for all new large-scale developments and consistent with practices in other European jurisdictions. The Department should put measures in place to ensure that 'community ownership' benefits all members of communities in equal measure and not just those in a financial position to engage with renewable energy projects. (Sections 7.5.1, 7.5.2, 7.6.2)

21. For community energy and small-scale renewable generation:
a) A review of the electricity market rules should be undertaken by the end of 2019 by the Department of Communication, Climate Action and the Environment in conjunction with the CRU in order to enable micro-generated electricity to be sold to the grid. This should include provision for a feed-in tariff for microgeneration to be set at least at the wholesale point price. The CRU should accelerate the national rollout of the smart metering programme to enable this and remove the barriers to grid connection that will be faced by microgeneration (i.e. approx. 11- 100 kw) and community led renewable generation projects (i.e. approx. 500 kw - 5 MW).
b) The Department of Housing, Planning and Local Government urgently amend planning regulations to remove planning restrictions on solar PV panels so as to enable increased microgeneration capacity at household, farm and small enterprise levels without planning permission. Revised regulations should be in place no later than March 2020.
c) To support Sustainable Energy Communities (SECs), the Government should put in place the following measures in 2019:
    i. Provision of a suite of specific funding and expert support measures to SECs to enable them to build on the excellent work that has been done to date;
    ii. oversee the development of an Energy Master Plan for the SECs; and
    iii. identify opportunities for specific projects to be undertaken that may be eligible for Government grant aid.

The SECs should be provided appropriate levels of support from the Department of Communications, Climate Action and the Environment, SEAI, the Climate Action Regional Offices, and their local authority. There should be an ambitious national target set by the Climate Action Council for installed SEC capacity by 2025 which may be at least 500MW.

d) The Department of Communications, Climate Action and the Environment should provide for support to a limited number of community-led pilot renewable

energy projects in 2019, if possible, through a ring fenced community pot in the first RESS auction, and through the Climate Action Fund. (Sections 7.5.3, 7.5.4, 7.6.2)

22. The Department of Communications, Climate Action and the Environment, in conjunction with the ESB, Eirgrid and Bord na Móna, should continuously examine the options available to the State to phase out coal and peat burning for electricity generation. The Department should also report quarterly to the Standing Committee. In addition, and in the interests of Just Transition, any decision to close Moneypoint and when peat extraction has ceased, the Government will guarantee to underwrite the current pay, conditions and pensions rights of workers affected where those workers continue to be employed in State renewable energy industries. (Section 7.7.1)

23. On bioenergy, the Committee recommends that:

    a) The Government re-evaluate its co-firing subsidy for peat and biomass given environmental concerns identified by the Climate Change Advisory Council;

    b) Bord na Móna and the ESB re-evaluate their future plans for biomass due to the lack of an indigenous supply, the outcomes should be reported to the Standing Committee on Climate Action by the end of 2019; and

    c) The Department of Communications, Climate Action and the Environment should finalise the Strategic Environmental Assessment of the draft National Bioenergy Plan by the end of Q2 2019. (Section 7.7.2)

Chapter 8: Agriculture and Land-use (Section 8.16)

The IPCC are due to publish a Special Report on Climate Change and Land (SRCCL) in August 2019. Its findings will be relevant to some of the recommendations in this Chapter and its findings should be considered once the report published. In particular, those recommendations hereunder relating to the land use review, to afforestation, forestry and peatlands should all take account of the results of the SRCCL once published.

24. The Committee recommends that the Department of Agriculture, Food and the Marine in conjunction with other Government Departments promptly engage with the farming, environmental and scientific communities to develop a plan for the agricultural sector to align it with meeting Ireland's Paris Agreement commitments. The measures identified through this process should be funded where necessary under CAP. As part of this inclusive process, the Department should:
    a) Devise priority proposals for funding of climate mitigation, biodiversity and carbon sequestration and storage measures under all aspects of the next CAP, to include robust indicators of the impacts of measures; (Section 8.4)
    b) Specify actions and timelines to implement and promote the uptake of the 28 measures contained in the mitigation pathway produced by Teagasc, with a focus on those which have the greatest GHG emission reduction potential, noting that many of these represent cost savings to farmers; (Section 8.5)
    c) Perform a critical review of current national land-use and agricultural schemes, tax credits through the agri-taxation review process, and reliefs, and incentives.

In light of this review, make available and promote a range of new schemes (or extend and expand where currently available) which support biodiversity, carbon sequestration and water quality including active rewetting and maintenance of bogs, riparian planting, agro-forestry, continuous cover forestry and hedgerow conservation. (Section 8.10)

d) Respond to the findings of the IPCC Special Report on Climate Change and Land (SRCCL) to be published in August 2019. (Section 8.13)

This process should begin within one month of the publication of this Committee's report with the plan for implementing actions (a) to (d) to be placed before the Oireachtas and the Standing Committee no later than 31 December 2019.

25. The Department of the Taoiseach should establish a multi-stakeholder forum[111] via the NESC on agricultural diversification and climate change, with the purpose of developing a suite of new opportunities for farmers through programmes and schemes to promote diversification in agriculture. This forum should be established by June 2019. (Section 8.7)

26. As knowledge transfer will be central to the delivery of mitigation strategies, it is recommended that the Department of Agriculture, Food and the Marine direct Teagasc to expand the resourcing of the agricultural advisory service to ensure advisors can focus on higher level consultancy work to provide tailored assistance to farmers in making the transition to low carbon farming (without imposing additional advisory costs on low-income farmers). The Department should build on current initiatives that incentivise engagement and peer-to-peer learning engaging all stakeholders (including independent advisors) to drive behavioural change, building on and expanding the remit of the recently launched Sustainability Support and Advisory Programme and the Dairy Sustainability Ireland initiative. The Department should promote increasing knowledge transfer on mitigation measures and opportunities also via farming bodies, farm advisors, farmers themselves, agricultural colleges and third level institutions. (Section 8.8)

27. The Committee recommends that the Government develop a national strategy for sustainable Anaerobic Digestion (AD) as a priority in order to actively pursue the development and facilitation of cooperatives to process slurry via AD to provide heat and energy and fertiliser to the agricultural sector and biomethane to consumers. The strategy should be published in 2019 and include consideration of viability, environmental impact, and potential funding support mechanisms. (Section 8.9)

28. The Committee recommends that the Climate Action Council in conjunction with other relevant bodies complete a review of national land use by spring of 2020 building on the Areas of Natural Constraint (ANC) review and other relevant analysis on land use. This should inform a national land-use plan, which will advise on suggested land use options in accordance with Ireland's Paris Agreement commitments and the UN Convention on Biological Diversity; balancing social, economic and environmental considerations. The

[111] forum to include as broad a range of stakeholders as possible including farm organisations, agri-food industry, NGOs and community organisations DAFM, DCCAE, Teagasc, the EPA, the Climate Change Advisory Council (or its replacement once established, the Climate Action Council).

review should inform the development of agri-environment policies, including the new CAP, recognising regionally differentiated strategies may be appropriate. (Section 8.10)

29. The current county-based hedgerow surveys should be extended nationwide by local authorities and once completed, by 2020, the Government should commission a study to quantify the climate mitigation and adaptation functions of this resource by 2021. This should inform strengthened policies, through CAP and other relevant policy instruments, to both improve hedgerow management and planting of new hedgerows. (Section 8.11)

30. In relation to afforestation and forest management, that:
    a) the Climate Action Council should undertake a comprehensive review of the climate mitigation potential of our forests[112] to be completed by December 2019.
    b) The results from this review should feed into the Department of Agriculture, Food and the Marines preparation of the National Forestry Programme (2021-2027), which should also consider the forestry recommendations set out in this report. The Department should bring forward a draft of the forestry programme no later than 2020.
    c) The Government should commission an independent review and sustainability audit of Coillte's forest business and other activities in 2019, in conjunction with a review of the *Forestry Act, 1988* to ensure that policy is consistent with the objective of environmental, social and economic sustainability in this sector. (Section 8.12)

31. Given the significant sequestration potential of peatlands, the Committee recommends that the Climate Action Council together with the National Parks and Wildlife Service develop a verifiable pathway for the rehabilitation and restoration of various peatland types in line with the overall national targets set out in Chapter 1 to achieve net sequestration from peatlands nationally by 2050. This pathway should include the development of a set of scientifically informed interim targets for various peatland types. The Government should assign responsibility for a national programme of rewetting and restoration for inclusion in Budget 2020**.**. (Section 8.13)

[112] This should include a focus on the issues set out in pages 72 - 74 of this chapter.

Chapter 9: Built Environment (Section 9.8)

The Committee recommends as follows:

32. The Department of Communications, Climate Action and the Environment with the SEAI and the Department of Housing, Planning and Local Government (DHPLG) should urgently carry out a needs assessment in order to determine the requirements for the delivery of the Government's target of retrofitting 45,000 homes per annum from 2021 and explore increasing it incrementally to 75,000 homes. This should include:

    a) Prioritising the categories of houses to be retrofitted with a focus on those with the lowest Building Energy Rating (BER);

    b) For all housing where the State is landlord, the DHPLG should set annual targets for each local authority to deliver deep retrofits of all of its public housing stock by 2030. The DHPLG should allocate necessary finances through the capital budget and explore funding support from the European Investment Bank (EIB).

    c) Producing a plan as a priority by Q3 2019 to meet the training and educational requirements of an enlarged workforce needed to deliver the retrofitting programme (early action in this regard can maximise the associated employment potential and economic, social and environmental benefits. (Sections 9.3, 9.7)

33. The Minister for Housing, Planning and Local Government should provide a road map by Q1 2020 for the decarbonisation of the rental stock by 2030. This road map should include a timescale and associated measures for requiring a minimum C BER for residential lettings. (Section 9.3.3)

34. That the DHPLG revise Parts L and F of the Building Regulations that relate to new builds to set a Nearly Zero Energy Building (NZEB) standard by end 2020. Local authorities should be sufficiently resourced to enforce these regulations. Furthermore, the Committee recommends that these regulations be revised to stipulate that new buildings should, where possible, be net energy producers to offset older inefficient buildings. (Section 9.4)

35. The Government should include in its all of Government plan on climate action measures for improving the energy performance of all schools, hospitals, and other public buildings, utilising district heating where possible. This should include:

    a) A provision that the installation of new fossil fuel based heating systems are not allowed in public buildings;
    b) a pathway so that all schools shall reach a BER of least B2 by 2030;
    c) a plan to improve energy efficiency and carbon footprints in hospitals;
    d) provision that the Office of Government Procurement facilitates the public sector's retrofitting program by procuring the main energy related investments and services.
    e) All public bodies should produce decarbonisation plans for all their energy use from now to 2050 with a target of 95% decrease in emissions. (Section 9.5)

Chapter 10: Transport (Section 10.11)

The Committee notes that transport is a complex problem to address and that substantial further investigation shall be required by the Standing Committee, the Climate Action Council and the Government as part of the all of government approach. The Committee in accepting the recommendations of the Citizens' Assembly makes the following initial recommendations:

36. The urgent delivery of proposed investment under Project 2040 and other programmes in low-carbon and zero-carbon modes of transport including major public transport infrastructure works, commencing in 2019 and calls for these and additional similar projects to be prioritised and expanded. (Section 10.5)

37. That the DTTAS review and bring forward a revised implementation plan for the outstanding policies and actions in its existing 2009-2020 policy Smarter Travel, *A Sustainable Transport Future* in time for Budget 2020 (Section 10.3)

38. The DTTAS, together with local authorities, should commence the full implementation of *the National Cycle Policy Framework* by 2020. In particular,
    a) Every local authority should set forth a clear pathway and timetable for the installation of dedicated cycling infrastructure, where lanes are kerb segregated where possible, in all urban areas;
    b) the DTTAS should also significantly increase funding in dedicated cycling infrastructure; and

    In addition, in line with the motion of the Dáil on Promoting Cycling approved on 17th January, 2019, all current transport infrastructure programmes should immediately be revised to achieve at least 10% expenditure on facilitating cycling (Sections 10.3, 10.4)

39. All cities with a population exceeding 75,000 should produce a sustainable transport plan (or a revised plan where one is already in existence) by no later than June 2020 for review by the NTA and DTTAS. In particular, all plans should:
    a) be in line with emissions reductions for 2021-2025 consistent with the first carbon budget (see Chapter 1);
    b) provide for a significant shift from private vehicle and road freight use, to intermodal solutions which include bus, rail, cycling and waterways; and
    c) integrate all public transport modes, community transport schemes, private transport operations and lift-sharing schemes.

    The Government must ensure that the sustainable transport plans and associated investment decisions are consistent with the Smarter Travel policy and that a dedicated multi annual budget be provided for the respective sustainable transport plans. (Sections 10.3, 10.4, 10.6)

40. There is a need for fast, frequent, cheap and reliable public rail connections between our major urban centres. In that regard, a rail infrastructure capacity review is needed and the DTTAS and Iarnród Éireann are requested to provide a strategy paper outlining all feasible options and associated investment implications by September 2019 to the Standing Committee. (Section 10.6)

41. The DTTAS, with other relevant Departments and agencies, should undertake a review of policy to expand the rural transport programme to include all transport modes to provide integrated public transport and shared mobility solutions[113] for all rural areas together with local authorities. This review should lead to a new rural transport strategy which should:
    a) include a comprehensive assessment of rural travel demand, and methodologies for determining same;
    b) set a target for modal shift and emissions reductions for 2021-2025 consistent with the first Carbon Budget (see Chapter 1);
    c) proposals for an integrated public transport network (to include Local Link, Bus Éireann, private bus operators and the school bus service) with all ancillary services (park and ride, bike hire, EV charging, lift sharing etc.) to be completed no later than 2030 with a view to providing comprehensive linked services for all rural areas; and
    d) develop a pilot scheme for a city and its regional hinterland to develop a best practice model. (Section 10.6)

42. There is a need to better support the transition to zero emission vehicles. In this regard the following actions are required:
    a) The Department of Communications, Climate Action and the Environment should accelerate the roll-out of a national fast-charging network aided by the Climate Action Fund and there should be a more ambitious roll out of EV charging infrastructure in accordance with the planned increases in EV numbers by 2030; and
    b) In order to encourage early adoption in a cost effective manner, the SEAI and DTTAS should ensure regular reviews of the need for existing grants, incentives and supports available for EVs (subject to the qualifications given in Chapter 6 in relation to grants versus low cost loans purchase) and examine the possibility of scrappage support for petrol and diesel vehicles. These reviews should include consideration of supporting or encouraging small and lightweight EVs including electric bicycles, tricycles, cargo bikes and small cars. (Section 10.7)

[113] Shared mobility solutions include lift-sharing, shared taxis and minibuses, utilising digital platforms to connect people such as https://www.blablacar.co.uk/ride-sharing-abroad/fr/ in France for example.

Ancillary recommendations of the Committee on Climate Action

The following comprises a list of ancillary recommendations made by the Committee as a result of its deliberations. The section of the Report where each recommendation arises is referenced. The recommendations fall into three categories, namely:

A. Those that arise from a recommendation of the Citizens Assembly;
B. Those that recommend further follow-up work for the Joint Committee in 2019 and thereafter; and
C. Those that relate to further work by the State or by public bodies.

A. Matters arising directly from the Citizens' Assembly

1. There were a number of recommendations arising from the Citizens' Assembly which required further substantive consideration. The Committee thus recommends the following in respect of three specific recommendations made by the Citizens' Assembly:
    a) That the Joint Committee, in response to Recommendation 2 of the Citizens Assembly dealing with the resilience of public land and infrastructure, should assess the state of play in relation to the Sectoral Adaptation Plans (SAPs) of relevant Government Departments and undertake a review of the adaptation measures put forward by public bodies starting in 2019. (Various Chapters)
    b) That the Joint Committee, in response to Recommendation 12 of the Citizens Assembly on food waste recommends that the Department of Agriculture Food and the Marine, in conjunction with relevant public bodies, examines the need for public information programmes on the climate and environmental impact of food choices and on the elimination of food waste with a view to improving citizens' habits and consumption patterns. The Department should present their findings to the Committee by 31st December 2019. (Section 8.14)
    c) That the Joint Committee, in response to Ancillary Recommendation 2 of the Citizens Assembly on reducing the use of plastics, recommends that the Joint Committee examine this issue as part of its future work programme.
    d) The need to examine the changes in infrastructure planning and delivery that would be needed if two thirds of all transport investment was in favour of public transport infrastructure as proposed by the Citizens' Assembly in Recommendation 10. (Section 10.5)

B. Matters for follow up by the Joint Committee

2. The Committee is cognisant of the large work programme that will fall on the Standing Committee as climate policy is developed in 2019 and in overseeing the implementation of those policies in the years ahead. These are set out in Section 1.4.3. In addition, due to time limitations, it is recommended that the following areas be revisited by the Standing Committee or as part of the work programme of the Joint Committee during 2019. These include, but are not limited to the following items:
    a) Review reports of public bodies, as requested in recommendations below, in the following specific areas
        i. The operation of the climate Action Fund (section 6.4)

ii. Measures to address delays in access to the electricity grid (Section 7.6.3)
iii. The assessment of the measures needed to fully decarbonise the built environment sector (9.3)
iv. The review of energy efficiency upgrades in the rental sector Section 9.9.3)

b) Examine pathways that would allow more communities to get involved in climate action. (Section 3.5)
c) The need to reach out in 2019 to the wider media industry, including the print and digital media, to establish how content creators and platforms can contribute to climate change leadership. (Section 4.4.2)
d) The need to hear from a wide range of experts on climate solutions that could be developed in Ireland through R& D (Section 5.3.1)
e) Examine ways, beyond energy efficient buildings, to reduce energy demand and increase energy efficiency. (Section 7.3)
f) The need to establish the extent to which the interconnection to the European Grid can be in State ownership. (Section 7.6.4)
g) The need to examine issues around taxation as a means to manage agricultural emissions including the evolving international policy landscape on GHG pricing and emissions trading. (Section 8.4.2)
h) Ways in which the State can broaden opportunities for organic farming. (Section 8.7.2)
i) Ways in which continuous cover forestry approaches to forest management can be supported. (Section 8.12)
j) The need to examine the currently policy framework on peatlands with a view to improving coherence and comprehensiveness. (Section 8.13)
k) The need to examine how the State can decarbonise the health sector and our public hospitals in particular. (Section 9.5.2)
l) Analyse the potential for:
    i. emissions reduction in the freight sector, including from getting greater use of our inland waterways
    ii. subsidising freight transport on our railways (Section 10.10)

j. Consider issues around International travel by both air and sea given that these are major sources of emissions that are not accounted for in national emissions declarations. (Section 10.10)
k. Examine the changes in infrastructure, planning and delivery that would be required to give effect to the 2 to 1 recommendation of the Citizens' Assembly.

C. Matters arising for the State and for public bodies

Chapter 1: The need for a new national framework

3. The State should proactively support increases in EU 2030 emission reduction targets, as a key element of the EU's compliance with its Paris Agreement obligations. (Section 1.3)
4. Public bodies should work together in networks so that the learning from good climate action outcomes is shared and that bodies are open to suggestions from staff on climate

actions. Executive board meetings of all public bodies should have climate action as a standing item on their agendas. (Section 1.4.4)

5. The Government needs to ensure that sufficient resources are allocated to the work of making regulatory and policy changes in the delivery of climate action. (Section 1.6)

Chapter 2: Supporting a Just Transition

6. The Regional Enterprise Plan (REP) Committee for the Midlands should assess the employment potential arising from the rewetting of the bogs in the midlands (Section 2.5.2)

Chapter 3: Citizen and Community Engagement

7. The Public Participation Networks (PPNs) and Local Community Development Committees (LCDCs) should be fully utilized and supported with additional resources to address climate change starting in Budget 2020 (Section 3.4)

8. The 'National Dialogue on Climate Action' should be further supported with additional resources to deliver its existing strategy of citizen engagement in climate action. (Section 3.5)

Chapter 4 Education and Communication

9. The Department of Education and Skills along with the National Council for Curriculum and Assessment should engage adult and community education experts in 2019 to examine how to ensure the provision of improved education on climate change and climate action among adults, local businesses and communities. (Section 4.3.2)

10. The Climate Action Council should consider creating its own online broadcasting platform for the dissemination of educational and informative content relating to climate change, climate action and climate justice. (Section 4.4.2)

Chapter 5 Unlocking potential

11. The Department of Business, Enterprise and Innovation should review the current funding landscape for support of enterprises in tackling climate change in 2019 in order to determine whether it can be streamlined. (Section 5.3.3)

12. The Department of Business, Enterprise and Innovation and the IDA should establish the extent to which they can support the Renewable Energy 100 programme which aims for businesses to reach 100% renewable energy use. (Section 5.3.3)

13. The Committee also notes opportunities provided by digital technologies and broadband services to expand remote-working practices, either from home or through dedicated co-working spaces. Such practices allow for reduced commuting and car-usage which can offer

several co-benefits, including reductions in transport emissions. The Committee recommends that the DBEI carry out analysis in 2019 on the advantages of, and obstacles to, remote-working practices, including in the context of the State's climate commitments. Based on the findings of this analysis, the DBEI should produce a strategy to support remote-working and smart community schemes and ensure improved coordination and engagement from relevant Government agencies. (5.3.3)

14. There is a need for appropriate structures and funding support mechanisms to be put in place, starting in the Budget 2020, to enable the State to nurture home-grown talent and recruit expertise from abroad in the area of climate science. (Section 5.3.1)

15. The Government should increase the proportion of overseas development aid that is focussed on climate finance. (Section 5.5)

Chapter 6: Incentivising Climate Action

16. The Government should promote the introduction of a carbon price floor in a co-ordinated approach with EU Colleagues. (Section 6.6.4).

17. A review of the eligibility criteria and the projects financed by the Climate Action Fund should be undertaken by the Department of Communication, Climate Action and Environment at regular intervals (and, where necessary, it should receive extra resources). The outcomes of such reviews should be referred to the Standing Committee on Climate Action. (Section 6.4)

Chapter 7: Energy

18. The Sustainable Energy Authority of Ireland (SEAI) should:
    a) develop its energy auditing programmes for business in 2019 with a view to offering a wider range of services to SMEs, farms and residential management companies and
    b) develop more innovative programmes in demand management and energy storage. (Section 7.3)

19. There is a need to establish how the State can facilitate and encourage the development of seagrass farms as part of our offshore wind development. (Section 7.4.1)

20. State companies such as Bord na Mona and Coillte should be encouraged to lead investment and research into the production of onshore renewable energy (wind and solar) through the use of State owned lands where such developments are environmentally and socially sustainable. (Section 7.5.1)

21. The Renewable Electricity Support Scheme (RESS) should now aim for renewables to make up 70% of our electricity generation by 2030. (Section 7.6.2)

22. The Commission for Regulation of Utilities (CRU) should report annually on the timeliness of grid connection. (Section 7.6.3)

23. The Government and the Climate Action Council should periodically review the viability and desirability of carbon capture and storage technologies adoption and report thereon to the Standing Committee. (Section 7.7.3)

24. The Renewable Energy and Support Scheme should facilitate the development of energy storage technology and EirGrid should develop a comprehensive energy storage plan as Ireland increases the penetration of renewables into the grid. (Section 7.8)

Chapter 8: Agriculture and Land-use

25. An independent assessment of Teagasc's GHG abatement measures should be commissioned to establish whether additional measures can be developed. (Section 8.5)

26. The Department of Agriculture Food and the Marine, in conjunction with Teagasc and the Environmental Protection Agency, should undertake a review of nitrogen fertiliser management and imports in 2019 in view of impacts on soil fertility, as well as EU climate and nitrate obligations. (Section 8.5)

27. There should be a greater focus on research into land diversification at agricultural colleges and also in the EPA and Teagasc which would help educate farmers on the benefits of diversification. (Section 8.6.2)

28. Teagasc should carry out research on the potential for productive use of rewetted peatlands such as paludiculture. (Section 8.13)

29. The Climate Action Council should develop comprehensive sustainability criteria for biomass production by end 2020. (Section 8.9.4)

Chapter 9: Built Environment

30. The Climate Action Council should review and report back to the Standing Committee on the level of ambition now required in the built environment sector to meet our international emissions obligations. That review should be cognisant of the needs for new building to house our growing population which shall necessarily place a call on the same workforce. (Section 9.3)

31. The outcome of the ongoing public consultation on proposed approaches to dealing with energy efficiency upgrades in rental properties should be examined by the Standing Committee. (Section 9.3.3)

32. The Department of Housing and Local Government should increase the level of annual upgrades of social housing where the State is landlord and report to the Committee. (Section 9.3.3)

33. The Department of Education and Skills should report back to the Standing Committee on how they envisage accelerating the decarbonisation process in schools. Priority should be given to those schools that are currently using oil fired boilers. They should also examine the capacity to bundle retrofit projects so as to achieve economies of scale. (Section 9.5.1)

34. The Standing Committee should review the implementation of the National Planning Framework for climate action, in particular in relation to the reduction of emissions associated with private car transport and dispersed housing development. Specifically that review should assess:
    a) whether County Development Plans are consistent with Regional Spatial and Economic Strategies so that all new development is compact, sustainable and ideally, accessible by public transport;
    b) the application of the vacant sites levy mechanism to clarify and strengthen its legal basis so as to ensure vacant land in urban areas is targeted for housing development (Section 9.6)

Chapter 10: Transport

35. The Department of Transport, Tourism and Sport should examine the feasibility of
    a) providing a guaranteed public transport service for all communities above a certain threshold and
    b) introducing free public transport in our cities

    and report thereon to the Standing Committee (Section 10.6.2)

36. The Department of Transport, Tourism and Sport and the National Transport Authority should review the incentives for small public service vehicles (in line with the recommendations of the Low Emissions Vehicles Taskforce). (Section 10.7.4)

37. The Department of Transport, Tourism and Sport should develop a strategy for end of life petrol and diesel cars and lithium batteries. (Section 10.7.4)

38. The Department of Transport, Tourism and Sport and the National Transport Authority should now move quickly to remove older buses from the public transport fleet and all new buses purchased henceforth should be low/zero emission vehicles. (Section 10.8)
39. The Department of Communications, Climate Action and Environment should review the source and sustainability of biofuel supplies for the transport sector in light of increasing concern about the sustainability and impacts of biofuel production. (Section 10.9)

Appendix 6: Background to international and national climate change

International response to climate change

In 1988 the Intergovernmental Panel on Climate Change (IPCC) was established as joint World Meteorological Organisation (WMO) and United Nations Environment Programme (UNEP) initiative and the international political response to climate change began with the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) at the 1992 Earth Summit held in Rio de Janeiro. The UNFCCC is driven by the Conference of the Parties (COP) to the UNFCCC. The UNFCCC entered into force in 1994 and set out a framework for action aimed at stabilising Greenhouse Gases (GHG) emissions to avoid dangerous climate change. The COP meets every year.

The Kyoto Protocol was adopted in 1997 (entering into force in 2005) and committed industrialised nations to stabilise GHG emissions from 2008 to 2012 (first commitment period). In 2012, the Doha Amendment to the Kyoto Protocol was adopted and this launched the second commitment period from 2013 to 2020.

During 2015, governments made pledges to reduce GHG emissions through the submission of Intended Nationally Determined Contributions (INDCs)**.** The EU and its Member States submitted their INDC to the UNFCCC committing to a binding target of at least a 40% domestic reduction in GHG emissions by 2030 compared to 1990 levels.

2015 Paris agreement

On 12 December 2015, almost 200 countries reached an historic agreement with the adoption of the Paris Agreement at COP21 which provides a framework for global action on climate change post 2020, to which all parties contribute. The objective of the Paris Agreement is to limit global temperatures well below 2°C above pre-industrial levels while making efforts to limit the increase to 1.5°C thereby protecting against dangerous climate change. It also addresses adaptation to climate change, financial and other support for developing countries (including the existing commitment to the Green Climate Fund to provide at least €100billion/year by 2020 by developed countries).

The agreement contains some provisions which are legally binding (such as the preparation and implementation of Nationally Determined Contributions (INDCs become NDCs once submitted) as well as reporting) and others that are voluntary. It does not provide for enforcement or sanctions. Parties decide their targets or NDCs themselves and must communicate them every five years for review with the intention of ratcheting them upwards at each review. In this way, the Paris Agreement has established a floor rather than a ceiling for cuts to GHGs by 2030 (European Parliament, 2016).

Paris was hailed a success by many but a failure by others. It was an agreed success in that it was the first global commitment on climate change of its kind but its detractors argue that it did not go far enough. Of primary concern is the gap between INDCs and what is actually required to keep warming below 2°C above pre-industrial levels (current pledges under the INDCs would limit global temperature increase to around 3°C). Ireland ratified the Paris Agreement on 4th November 2016, the day on which it came into force.

The latest (23rd) Conference of the Parties (COP23) to the UNFCCC was held in Bonn in November 2017 and focused on climate change with key outcomes including a push for a phase out of coal and discussions over the withdrawal of the USA from the Paris Agreement[114].

Background to Irish climate change policy

Ireland's response to climate change is shaped by its commitments at EU and international levels. In 2007, the Government published the National Climate Change Strategy (NCCS) 2007-2012 which set out a range of measures to meet Ireland's European climate change commitments.

The European Commission published a White Paper on adapting to climate change in 2009, which was followed by the publication of the EU Adaptation Strategy in 2013. In response to the 2009 EU White Paper on adapting to climate change, the then Department of Environment, Community and Local Government published a National Climate Change Adaptation Framework (NCCAF) (2012**)**. The policy in relation to climate adaptation, first set out in the NCCAF, was subsequently restated in the National Policy Position on Climate Action and Low Carbon Development (2014)**[115]**. These policy papers were non-statutory.

The Climate Action and Low Carbon Development Act 2015 placed national climate policy in legislation with the ultimate aim of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy by 2050. To achieve this transition, a key provision of the Act requires the Minister to devise a National Mitigation Plan (NMP) to reduce GHG emissions, a National Adaptation Framework (NAF) to respond to changes caused by climate change and Sectoral Adaptation Plans (SAP), with each plan reviewed every five years.

The 2015 Act also established the Climate Change Advisory Council**,** an independent advisory body tasked with assessing and advising on how Ireland is making the transition to a low carbon, climate resilient and environmentally sustainable economy by 2050.The Council works to provide contributions in critiquing, informing and shaping Ireland's response to climate change. It advises Ministers and Government in relation to the preparation of plans envisaged under the 2015 Act. The Act did not set any specific targets for GHG emissions reductions nor did it provide a definition of low carbon. It was greeted with mixed reaction.

In December 2015 the Government launched its White Paper on Ireland's transition to a low carbon energy future 2015-2030. Its vision is of a low carbon energy system where GHG emissions from the energy sector will be reduced by between 80-95%, compared to 1990 levels, by 2050, and will fall to zero or below by 2100 (Department of Communications, Energy and Natural Resources, 2015). While the White Paper commits Ireland to radically reducing our dependence on fossil fuels and also our greenhouse gas emissions by 2050, it does however acknowledge that (as recognized by the International Energy Agency), oil and gas will continue to play a role in Ireland's energy mix well into this century, albeit on a declining basis over time. Ireland's indigenous natural gas supply will play an important role in our security of supply. It is expected that at peak production, gas from the Corrib field will provide up to 42% of our natural gas needs over the first two years of operation.

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[114] https://www.carbonbrief.org/cop23-key-outcomes-agreed-un-climate-talks-bonn

[115] https://www.dccae.gov.ie/documents/National%20Adaptation%20Framework.pdf

In July 2017 the Department for Communications, Climate Action and Environment published Ireland's first National Mitigation Plan (NMP) in accordance with the provisions of the *Climate Action and Low Carbon Development Act, 2015*. It contains the existing mitigation measures and those under consideration. It also sets out 106 individual actions (policy measures or "sectoral mitigation measures") needed to reduce GHG emissions thereby contributing towards Ireland's challenges regarding its 2020 and 2030 GHG emissions targets and the national longer-term goal of decarbonisation by 2050. The NMP shall be reviewed at least once every five years.

Described as a "first step" in reaching a low carbon and climate resilient economy by 2050, the NMP covers GHG emissions in the electricity generation, built environment, transport, agriculture, forestry and land use sectors. For each sector it specifies the policy measures to be adopted by each of the Ministers of Government[116] ("sectoral mitigation measures") to reduce GHG emissions and enable the achievement of the national transition objective within each sector[117].

In January 2018 the Department of Communications, Climate Action and Environment published Ireland's first statutory National Adaptation Framework, Planning for a climate resilient Ireland**.** The NAF builds on the work already carried out under the National Climate Change Adaptation Framework (NCCAF, 2012). The NAF outlines a whole of government and society approach to climate adaptation in Ireland and provides for measures such as flood protection.

Under the NAF, a number of Government Departments are required to prepare Sectoral Adaptation Plans (SAPs) which will set out the adaptation measures that they intend to take in an area under their remit. Work on these plans began in 2018. Local authorities are required to prepare local adaptation strategies. The NAF will be reviewed at least once every five years. The NAF also aims to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector and the research community.

National planning policy

On 16 February 2018 the Government published *Project Ireland 2040.* Project Ireland 2040 comprises two reports – the National Planning Framework (NPF) and the National Development Plan 2018-2027 (NDP). The Department of Housing, Planning and Local Government on behalf of the Government is responsible for the NDP and NPF.

The National Planning Framework (NPF) anticipates that Ireland will grow significantly in the next twenty years with an extra one million people expected to be living here by 2040 and a need for an extra 550,000 homes close to services and amenities. It has been developed in parallel with three Regional Spatial Economic Strategies and sets out a high-level framework for planning and development in Ireland to 2040. The focus of the plan is on:

- Growing Ireland's regions, cities, towns and villages;
- Building more accessible urban centres of scale; and
- Better outcomes for communities and the environment, through more effective and coordinated planning, investment and delivery.

[116] Ministers for Communications, Climate Action and Environment; Housing, Planning and Local Government; Agriculture, Food & Marine; and Transport, Tourism and Sport.
[117] https://www.energyireland.ie/irelands-national-mitigation-plan-centred-on-a-commitment-to-decarbonise-energy/

The National Development Plan is the 10-year, €116 billion programme underpinning the NPF. The capital will be used to upgrade Ireland's infrastructure in anticipation of the population increase[118]. The NDP includes for the strategic investment priority to transition to a low carbon and climate resilient society. It has committed funding of €21.8 billion (€7.6 billion Exchequer/€14.2 billion non-Exchequer) to achieve this. In addition, the NDP allocated a further €8.6 billion for investments in sustainable mobility. Included in the measures set out under the NDP to transition to a low carbon economy are the objective to have 500,000 electronic vehicles on the road by 2030, investments in energy efficiency through the upgrading of homes and the latest Renewable Electricity Support Scheme.

Ireland's progress and European commitments

Ireland's GHG emissions are broken into two main sectors – those under the EU Emissions Trading Sector (ETS) which covers power generation and heavy industry, and those under the non-Emissions Trading Sector (non-ETS) which covers agriculture, transport, residential, non-energy intensive industry, commercial services and waste. Each has separate EU targets to 2020.

The EU 2020 Climate and Energy Package is a set of binding legislation to ensure the EU meets its climate and energy targets for the year 2020. It sets out three key targets:

- 20% cut in greenhouse gas emissions (from 1990 levels);
- 20% of EU energy from renewables; and
- 20% improvement in energy efficiency.

The EU Emissions Trading Scheme (ETS) is the EU's key tool for cutting GHG emissions from large-scale facilities in the power and industry sectors, as well as the aviation sector. The ETS covers around 45% of the EU's GHG emissions and the ETS target is to reduce emissions from these sections by 21% on 2005 levels by 2020.

Ireland's emission reduction targets[119] for the non-ETS sectors are to reduce GHG emissions by 20% on 2005 levels by 2020.

The 2030 Climate and Energy Framework was adopted by the EU in 2014 and builds on the 2020 Climate and Energy Package. It sets three key targets for the year 2030:

- At least 40% cuts in greenhouse gas emissions (from 1990 levels);
- At least 32% share for renewable energy[120]**;** and
- At least 27% improvement in energy efficiency**.**

Specifically to achieve the 40% cuts in GHG emissions (from 1990 levels), the EU ETS sectors would have to cut emissions by 43% (compared to 2005) and the non-ETS sectors would need to cut emissions by 30% (compared to 2005). How this translates into individual binding targets for Member States is to be confirmed. However, the European Parliament and the Council reached a

[118] DHPLG, 2018. *Reimagining our country: Government launches €116 billion Project Ireland 2040, 16 February* [online]. Available at: http://npf.ie/project-ireland-2040-launched/ [accessed on 04.04.2018]
[119] As set down under the EU Effort Sharing Decision (Decision No 406/2009/EC) which is included as a part of the EU 2020 Climate and Energy Package
[120] The target was 27% but was raised to 32% by the EU Member States and European Parliament representatives on 14 June 2018. Further information in the Guardian

provisional agreement on the effort sharing regulation - a major Commission proposal for implementing the EU's 2030 climate target – in December 2017. Together with the recently endorsed revision of the EU emissions trading system (ETS) after 2020, the legal framework for the *2030 Climate and Energy Framework* is now in place[121]. The proposed reduction in GHG emissions in 2030 for Ireland is 30% below their 2005 levels (with some built-in flexibilities)[122]. The longer term aim is an 80% reduction in GHG emission by all Member States by 2050[123].

Emissions gap

According to the EPA's most recent report on GHG emissions projections for 2017-2035 (May 2018)[124], Ireland is going to miss its EU 2020 GHG emissions targets by a significant margin. On the basis of current policies, Ireland is also heading in the wrong direction for EU 2030 targets as well as our 2050 goal of transitioning to a decarbonised economy. This is due to an overall increase in GHG emissions from most sectors over the period as a result of relatively low fuel costs leading to increased energy demand and to strong projected economic growth. Key contributors to rising GHG emissions are the continued use of coal and peat in power generation in Ireland. Agriculture and transport dominate non-ETS emissions although the increases in transport should be tempered with an increase in electric cars into the future[125].

The EPA report (May 2018) provides an updated assessment of Ireland's:

- Total projected GHG emissions out to 2030;
- Progress towards achieving its non-ETS emissions reduction targets up to 2020 (i.e. those set out under the EU Effort Sharing Decision No 406/2009/EU); and
- A longer-term assessment based on current projections.

The EPA predictions do not consider the impacts from policies and measures proposed under the NDP or the full impact of policies and measures from the NMP. The EPA sets out two scenarios – GHG emissions projections scenario *with existing measures* and *with additional measures*.

To this end, the EPA report[126] states that:

"Total emissions are projected to increase from current levels by 1% and 4% by 2020 and 2030 respectively under the With Existing Measures scenario. Under the With Additional Measures scenario emissions are estimated to increase by 2% by 2020 and decrease by 1% by 2030."

It further states that:

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[121] http://europa.eu/rapid/press-release_STATEMENT-17-5382_en.htm

[122] Refer to Annex I of Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 for a resilient Energy Union and to meet commitments under the Paris Agreement and amending Regulation No 525/2013 of the European Parliament and the Council on a mechanism for monitoring and reporting greenhouse gas emissions and other information relevant to climate change [online]. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1471002113213&uri=CELEX:52016PC0482 [accessed on 04.04.2018]

[123] http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/589799/EPRS_BRI(2016)589799_EN.pdf

[124] EPA, 2018. *Ireland's greenhouse gas emissions projections 2017-2035.* May. [online]. Available at: https://www.epa.ie/pubs/reports/air/airemissions/ghgprojections2017-2035/EPA_2018_GHG_Emissions_Projections_Summary_Report.pdf [accessed on 14.06.2018]

[125] EPA, 2018. *Ireland's greenhouse gas emissions projections 2017-2035.* May. [online]. Available at: https://www.epa.ie/pubs/reports/air/airemissions/ghgprojections2017-2035/EPA_2018_GHG_Emissions_Projections_Summary_Report.pdf [accessed on 14.06.2018]

[126] EPA, May 2018, *Ibid*

"In terms of compliance with the EU's Effort Sharing Decision (Decision No 406/2009/EC) 2020 targets, Ireland's non-Emissions Trading Scheme[127] emissions are projected to be 0% and 1% below 2005 levels in 2020 under the With Existing Measures and With Additional Measures scenarios, respectively. This compares to the target of 20% below 2005 levels by 2020."

This represents a significant distance from Ireland's total GHG emissions reduction targets and non-ETS emissions targets under each scenario[128]. New policy measures and initiatives are needed if Ireland is to make a real difference to GHG emissions[129]. Further information is provided in the EPA (May 2018) report[130].

[127] These sectors cover agriculture, transport, built environment (residential, commercial/institutional), waste and non-energy intensive industry
[128] As set down under the EU Effort Sharing Decision (Decision No 406/2009/EC)
[129] Climate Change Advisory Council, 2018. Opening statement to Oireachtas Committee on the Environment 30 January. [online]. Available at: http://www.climatecouncil.ie/media/FINAL%20Oireachtas%20Statement%20JFitzGerald%2030.01.2018.pdf [accessed on 13.06.2018]
[130] EPA, May 2018.

Appendix 7: Climate Change science

Global climate change

The Committee was given a primer on the state of the science of climate change by Prof. Peter Stott of the UK Met Office who was a Coordinating Lead Author on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) and is an expert in detection and attribution. Prof. Stott outlined how the evidence for recent changes in our climate system is unequivocal. Many aspects of our climate system, not just surface temperatures, are changing rapidly and all in a manner consistent with an overall warming. He went on to illustrate how human influence upon the climate system is clear. We can only begin to explain the last 60 or so years of observations adequately in climate simulations using state-of-the-art models when the effects of humans arising primarily from the burning of oil, coal and gas are included. He explained how in the past decade we have moved from ascribing large-scale changes in mean climate to consideration of the changing odds of impactful extremes such as extreme rainfall, drought and heatwaves. Globally the effects of our historical emissions of heat-trapping gases has greatly shifted the odds of extreme rainfall and heatwaves to increase the risk. Both globally, but also regionally and nationally we are already experiencing the impacts of climate change in our daily lives. Finally Prof. Stott highlighted how the future is in our hands. If we continue on a business as usual trajectory the world we leave future generations will be much more greatly changed than if we were to take meaningful action.

The Committee heard evidence from three invited experts – Prof. Valerie Masson-Delmotte, Prof. Sonia Seneviratne and Dr. Pierre-Marie Aubert on the IPCC Special Report on 1.5C (SR1.5) warming commissioned directly by the UN Framework Convention on Climate Change to inform the Paris Agreement. The Committee were very grateful to these experts to attend so soon after publication of the report. The Committee in particular note that having both the overall lead of the production of this special report Prof. Masson-Delmotte and a significant Lead Author Prof. Seneviratine attend was hugely beneficial. In turn, the experts all commented very positively on the session and the fact that Committee members were engaged and thoughtful in their questions which were solution oriented. They also commented very positively on the precursor Citizens' Assembly, and indeed, the following weekend Prof. Masson-Delmotte and a number of colleagues co-signed an op-ed in a French national newspaper advocating copying that approach.

The invited experts to the session on SR1.5 provided a comprehensive overview of the key findings therein. Today the climate is estimated to be 1.1 degrees warmer than pre-industrial, and all of that change is very likely due to our collective historical actions globally. They stressed that emissions to date do not, yet, commit us to a global change exceeding 1.5C. However, the window to avoid exceeding 1.5 degrees is rapidly closing. To have an even-odds chance of staying below 1.5 degrees requires global emissions to be halved by 2030 and to be net zero by 2055 if not earlier. Delays in action will require even more aggressive ambition later. All emissions are required to be addressed. They stressed that not addressing emissions of methane and nitrous oxide means that even more aggressive efforts are required on Carbon Dioxide. They stressed that to achieve the 1.5C change required large-scale system change on a scale unprecedented in human history and that this required climate change considerations to be at the heart of decision making.

The SR1.5 showed, unambiguously, that keeping warming to below 1.5C avoided a host of impacts compared to allowing a 2C change. The avoided impacts amount to huge economic savings in the long-term running to hundreds of trillions of dollars globally by 2100. In non-monetary terms, the saved impacts on critical ecosystems, on human health etc. are considerable. This finding extends to other, larger changes. Current pledges under the Paris Agreement, if met, would lead to warming exceeding 3C. Committee members were thus made aware that ambition will need to be ratcheted and that national emissions targets will almost certainly become yet more stringent in future.

The invited experts were frank in their assessment that the challenges to achieving a target of keeping global mean warming below a 1.5C target were considerable. They stressed that there was no simple single solution and that all countries, communities and individuals had unique sets of challenges as well as opportunities. Rather than adopting single high-profile solutions systemic change is required. They provided a rich tapestry of examples and opinions of relevance nationally and at the community level.

The experts testimony can be summed up in the closing aspect of the prepared remarks of Prof. Masson-Delmotte that have been used in numerous other contexts in the communication of the SR1.5 thus:

- Every action matters
- Every bit of warming matters
- Every year matters
- Every choice matters

If we are to minimise the impacts of climate change for ourselves and generations to come then as a global society we need to take action starting now.

Ireland and climate change

Observations show that Irish climate is changing in tandem with global changes, with the rate of change consistent with regional and global trends across a range of variables (Dwyer, 2012). Mean annual surface air temperature in Ireland has increased 0.8^{o}C over the past 110 years and all seasons are warmer (Nolan, 2012). Annually the number of warm days has increased and the number of frost days has decreased (Walsh and Dwyer, 2012). In the context of the last 300 years the most recent decade has been the wettest on record (Murphy et al. 2018). Since the early 1990s sea level rise of approximately 3.5cm per decade has been observed (Devoy, 2008).

Recent national scale extreme events, from the winter storms of 2013/14 and the resulting flooding of the Shannon and other catchments associated with Storm Desmond, through the intense rainstorms in Donegal in August 2017, to the summer heatwave and drought of 2018 serve to highlight Ireland's vulnerability to extreme events. The fingerprint of climate change had also been evident in recent extremes with the summer heatwave of 2018 made more likely as a result of climate change (WWA, 2018). Much work has been completed by different research groups from Irish Universities and Met Eireann on exploring future impacts. This work shows that here we are likely to experience wetter winters, drier summers and more frequent extreme weather events, with associated implications across multiple sectors.

Some examples help to develop insights (Matthews et al. 2016). Over the period 1900–2014 records suggest that a summer as warm as 1995 (hottest summer on record for Ireland) has become 50 times more likely, whilst the probability of a winter as wet as 1994/1995 (the wettest winter on record until winter 2015/2016) has doubled. The likelihood of the driest summer (1995) has also doubled since 1850. Under the business as usual greenhouse gas emissions, climate model projections suggest that our hottest summer historically may be seen as an unusually cool summer in future. By the end of the century, summers as cool as 1995 may only occur once every 7 years or so (Matthews et al. 2016). Winters as wet as 1994/95 and summers as dry as 1995 may become 8 and 10 times more frequent, respectively (Matthews et al. 2016). Insights into what these changes mean for Irish society is afforded by examining the impacts that these extremes had. The hot and dry summer of 1995 was associated with increased mortality (especially among the elderly and infirm) in Ireland. Rainfall deficits and water shortages in summer 1995 also adversely impacted the agricultural sector. The effects of the latter have the potential to be felt internationally through Ireland's agricultural exports.

Water shortages were a common occurrence across Ireland in 1995, with record low water levels on the Shannon impacting tourism. Water supplies for major cities like Dublin were also tested. Given that water supply in Dublin has failed to keep pace with increased demand from population growth and other factors, summers as dry as 1995 becoming 10 times more frequent would pose significant challenges for many of our large urban areas. The wettest winters on record have also been associated with widespread flooding. Under a business as usual greenhouse gas emissions, winters as wet as 1994 becoming 8 times more frequent (Matthews et al. 2016). Together with the population growth expected in Ireland over the coming decades, and the already high flood exposure, such change would likely make flooding a much more familiar experience for Irish society.

Even if we meet the Paris objectives and limit global temperature rise to no more than 2oC, the impacts of climate change for Ireland are likely to be significant. Research suggests that with 2oC increase in global mean temperature above pre-industrial, Ireland will likely be a hotspot for both floods and droughts within the context of Europe (Roudier et al., 2016). Therefore, mitigation and adaptation are both important components of climate action at the national level.

Current national emissions versus international obligations

The Committee heard expert testimony from both the EPA and MaeRI that pointed to a systematic failure at a national level to meet international emission reduction obligations to date. The target of a 20% reduction from 2005 national levels by 2020 will fail to be met by a substantial margin with the most recent national annual inventory for 2017 from the EPA showing that we have achieved solely a 1% reduction to date with emissions now increasing. The evidence showed that we have thus far failed in decoupling emissions growth from economic growth in most sectors. The 2030 target is even more stringent and is likely to become more so under the ratchet mechanism of the Paris Agreement. National planning should be made under the assumption that the European Union would adopt and cascade to national level the targets implied by the IPCC SR1.5 of a 50% reduction by 2030 and reaching net-zero by 2050 or 2055.

The expert testimony received underscored the fact that there is no simple solution that can achieve such a stringent target. Rather, a range of expert testimony throughout the committee's

deliberations pointed to the need to adopt a broad spectrum of responses at the individual, community, regional and national levels. Action shall be required at all of these levels but can only be achieved if aspects of national policy, taxation, incentives etc. are fully aligned with such an aim and constantly reviewed and revised for effectiveness. It requires an effective partnership between the State, the private sector, public bodies and civil society to be attained. No sector or special interest can be exempted if we are to be successful, underlining the import of co-developing solutions that are acceptable to all sectors and civil society alike.

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Appendix 8: List of correspondence received by the Committee

JCCA/1	Stop Climate Chaos Coalition
JCCA/2	Deputy Eamon Ryan
JCCA/3	The Royal Irish Academy
JCCA/4	Dogwood Alliance
JCCA/5	Smart Farming
JCCA/6	Better Environment with Nuclear Energy
JCCA/7	Smartzone
JCCA/8	Deputy Paul Murphy
JCCA/9	Wind Aware Ireland
JCCA/10	The Irish Farmers' Association
JCCA/11	Stop Climate Chaos Coalition
JCCA/12	Deputy Marcella Corcoran Kennedy
JCCA/13	Irish Academy of Engineers
JCCA/14	Irish Climate Science Forum
JCCA/15	Irish Solar Energy Association
JCCA/16	Mr. Niall O'Reilly
JCCA/17	Centre for Marine and Renewable Energy
JCCA/18	Parliamentary Budget Office
JCCA/19	Stop Climate Chaos
JCCA/20	Environmental Protection Agency
JCCA/21	Department of Communications, Climate Action and Environment
JCCA/22	Professor John Sweeney
JCCA/23	Stop Climate Chaos Coalition
JCCA/27	Mr. Ronan Browne (Wind Aware Ireland)
JCCA/28	Mr. Tom Brennan
JCCA/29	Sustainable Energy Authority of Ireland
JCCA/30	Department of Communications, Climate Action and Environment
JCCA/31	Department of Communications, Climate Action and Environment
JCCA/32	Commission for Regulation of Utilities
JCCA/35	Institute for Public Policy Research

JCCA/36	ESB
JCCA/37	Wind Aware Ireland
JCCA/38	Trócaire
JCCA/39	Department of Education and Skills
JCCA/40	Irish Congress of Trade Unions
JCCA/44	Better Environment with Nuclear Energy
JCCA/45	The Department of Transport, Tourism and Sport
JCCA/46	The Latin America Solidarity Center
JCCA/49	Department of Transport, Tourism and Sport
JCCA/50	Sustainable Energy Authority of Ireland
JCCA/51	Department of Business, Enterprise and Innovation
JCCA/52	Mr Ray Bates (UCD)
JCCA/66	Office of Public Works
JCCA/67	ESB
JCCA/68	National Transport Authority
JCCA/69	IDA Ireland
JCCA/71	Department of Transport, Tourism and Sport
JCCA/72	Department of Public Expenditure and Reform
JCCA/73	Office of Public Works
JCCA/74	Department of Finance
JCCA/75	Department of the Taoiseach
JCCA/76	Department of Education and Skills
JCCA/77	Department of Agriculture, Food and the Marine
JCCA/78	Department of Communications, Climate Action and Environment
JCCA/79	Department of Rural and Community Development
JCCA/80	Department of Rural and Community Development
JCCA/81	The Hemp Company
JCCA/82	The Department of Business, Enterprise and Innovation
JCCA/83	Office of Public Works
JCCA/84	Department of Health
JCCA/85	Department of Transport, Tourism and Sport

JCCA/86	Department of Housing, Planning and Local Government
JCCA/87	Department of Finace
JCCA/88	Department of Rural and Community Development
JCCA/89	Minister for Communications, Climate Action and Environment
JCCA/90	Stop Climate Chaos Coalition
JCCA/91	Department of Communications, Climate Action and Environment
JCCA/92	Stop Climate Chaos Coalition
JCCA/93	Mr David Emerson
JCCA/94	Department of Agriculture, Food and the Marine
JCCA/95	Mr. Mike Loughnane
JCCA/96	Bord na Móna
JCCA/97	Irish Wildlife Trust
JCCA/98	Business in the Community Ireland
JCCA/99	Irish Congress of Trade Unions
JCCA/100	Nicholas Grubb
JCCA/101	Irish Natura And Hill Farmers Association
JCCA/102	Freight Transport Association Ireland
JCCA/103	Mr. Ray Bates (UCD)
JCCA/104	Friends of the Earth
JCCA/105	Irish Wind Energy Association
JCCA/106	Tánaiste and Minister for Foreign Affairs and Trade
JCCA/107	Deputy Denis Naughten
JCCA/108	EirGrid
JCCA/109	An Taisce
JCCA/110	Department of Housing, Planning and Local Government
JCCA/112	Department of Finance
JCCA/113	Feasta Climate Group
JCCA/114	An Taisce
JCCA/115	Cyclist.ie
JCCA/116	Stop Climate Chaos Coalition
JCCA/117	MaREI Centre

JCCA/118	Birdwatch Ireland
JCCA/119	An Taisce
JCCA/120	Ibec
JCCA/121	Irish Climate Science Forum
JCCA/122	Friends of the Earth
JCCA/123	Ervia
JCCA/124	Institute of International and European Affairs
JCCA/125	Sub-Committee on Dáil Reform
JCCA/126	An Taisce
JCCA/127	Irish Wind Energy Association
JCCA/128	Coastal Concern Alliance
JCCA/129	Futureproof Clare
JCCA/130	Deputy Eamon Ryan
JCCA/131	Law Society of Ireland
JCCA/132	Coastal Concern Alliance

Appendix 9: Glossary and Abbreviations

2015 Act	Ireland's *Climate Action and Low Carbon Development Act 2015*
Adaptation	Adaptation means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise. It has been shown that well planned, early adaptation action saves money and lives later. For example, building flood defences in anticipation of rising sea levels.
AD	Anaerobic Digestion is a way of generating renewable energy – micro-organisms break down biodegradable waste material (such as slurry and manure) or energy crops (such as grass and maize) in the absence of oxygen and produce a biogas and nutrient-rich waste material called digestate.
AR	Ancillary recommendation of the Citizens' Assembly
BAI	Broadcasting Authority of Ireland
BER	Building Energy Rating – a BER certificate indicates the energy performance of a building. It rates the building on a scale of A-G. A-rated homes are the most energy efficient and will tend to have the lowest energy bills. G-rated are the least energy efficient.
Bioenergy	Bioenergy is made from organic material that comes from plants and animals. It is a renewable source of energy and can reduce GHGs but only if produced sustainably. Biomass (such as trees, crops and grass) can be burned directly or converted to liquid biofuels (usually used for transport) or biogas (such as the methane produced from AD which can be used for heat/power on-site or for transport) that can be burned as fuels.
CAP	Common Agricultural Policy
Carbon budget	Carbon budgets consist of a single figure of Carbon dioxide equivalent (CO_2-eq) which represents the five-yearly allocation of greenhouse gas emissions for the whole country. Carbon budgets are determined by accurate scientific data to set the maximum limit of greenhouse gas emissions across the economy, not just the non-ETS. Carbon budgets include methane (CH_4).
CARO	Climate Action Regional Office
CCAC	Climate Change Advisory Council
CCF	Continuous Cover Forestry
CO_2	Carbon dioxide
CO_2-eq	A CO_2 equivalent, abbreviated as CO_2-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 CO_2 with the same global warming potential.[131]
COPD	Chronic Obstructive Pulmonary Disease
COP	Conference of the Parties (to meetings of the UNFCCC)

[131] Source: Eurostat, n.d. *Glossary carbon dioxide equivalent* [online]. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Carbon_dioxide_equivalent [accessed on 22.03.2019]

COP21	21st Meeting of the COP which culminated in the international Paris Agreement on Climate Change in December 2015
COP24	Most recent COP held in Poland in December 2018
CRU	Commission for the Regulation of Utilities
DCCAE	Department of Communications, Climate Action and Environment
DHPLG	Department of Housing, Planning and Local Government
DTTAS	Department of Transport, Tourism and Sport
DBEI	Department of Business, Enterprise and Innovation
DES	Department of Education and Skills
ECP	Enduring Connection Policy – the CRU policy approach to access to the national electricity grid
EPA	Environmental Protection Agency
ETS	Emissions Trading Sectors (sectors which fall under the European trading system for GHG emissions, i.e. power generation and heavy industry)
EU	European Union
EV	Electric Vehicle
Fossil fuels	Natural non-renewable energy sources such as peat, oil, gas and coal. Burning fossil fuels releases GHG emissions
GHG	Greenhouse gas emissions (emissions causing climate change, the main three of which are carbon dioxide, methane and nitrous oxide)
IDA Ireland	The agency responsible for the attraction and retention of inward foreign direct investment (FDI) into Ireland
INDCs	Intended Nationally Determined Contributions (contributions by European Member States to reduce GHGs)
IPPC	Intergovernmental Panel on Climate Change
Kw	Kilowatt (one thousand watts), measurement of electrical power. Used to measure, for example, the amount of electricity generated from a wind farm
LCDCs	Local Community Development Committees
MABS	Money Advice Budgetary Service
MAFA	*Maritime Area and Foreshore (Amendment) Bill.* The General Scheme of the MAFA was published in 2013. The Bill needs to be published and enacted to provide regulatory certainty for offshore renewable energy projects.
MaREI	Marine and Renewable Energy Ireland centre
Microgeneration	small-scale generation of renewable energy on a household / farm / business level. Microgeneration can, for example, provide some/all of a households heat and/or electricity needs from the use of solar PV. In the future it will be possible to export any excess electricity generated to the national grid
Mt	Metric tonne (one million tonnes), used to measure, for example, GHG emissions
Mw	Megawatt (one million watts), measurement of electrical power. Used to measure, for example, the amount of electricity generated from a wind farm, generated from wind energy for example

Mitigation Measures	Generally involves measures aimed at reducing GHG emissions, for example, increasing the use of electric vehicles in favour of conventional cars. Mitigation may also be achieved by increasing the capacity of carbon sinks, e.g., through reforestation
NAF	Ireland's *National Adaptation Framework (2018)* on Climate Change as required under the 2015 Act
NCCA	National Council for Curriculum and Assessment
NCCS	Ireland's *National Climate Change Strategy 2007-2012 (*non-statutory)
NDP	Ireland's *National Development Plan 2018-2027* (which includes strategic investment priorities to transition to a low carbon and climate resilient society)
NECP	National Energy and Climate Plan - the new framework within which EU Member States have to plan, in an integrated manner, their climate and energy objectives, targets, policies and measures to the European Commission.
NESC	National Economic and Social Council
NHA	Natural Heritage Area designated under the Irish Wildlife Acts. Examples include some Irish peatlands.
NGO	Non-Governmental Organisation
NMP	Ireland's *National Mitigation Plan on Climate Change (2017)* as required under the 2015 Act
NTA	National Transport Authority
Non-ETS	Non-Emissions Trading Sector (sectors which do not fall under the European ETS, i.e. agriculture, transport, residential, non-energy intensive industry, commercial services and waste)
NPF	Irelands *National Planning Framework to 2040*
NZEB	Nearly Zero Energy Building – this is a building with a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including renewable energy produced on-site or nearby (SEAI)
ODA	Official Development Assistance
OECD	Organisation of Economic and Community Development
PAC	Oireachtas Committee of Public Accounts
Paludiculture	The wet alternative to drainage-based use of degraded peatlands
PPNs	Public Participation Networks
Q	Quarter of the year
R	Voted recommendation of the Citizens' Assembly
R&D	Research and Development
RE	Renewable energy (wind, solar, geothermal etc.)
REP	Regional Enterprise Community
RESS	Renewable Electricity Support Scheme
Retrofit	Upgrading the energy efficiency of older energy inefficient homes, for example through attic insulation

SAC	Special Area of Conservation for habitats and species designated under the EU Habitats Directive. Examples include some Irish peatlands.
SAP	Sectoral Adaptation Plans for relevant Government departments required under the 2015 Act
SBCI	Strategic Banking Corporation of Ireland
SEAI	Sustainable Energy Authority of Ireland
SECs	Sustainable Energy Communities
SMEs	Small and Medium sized Enterprises
SPA	Special Protection Area for birds designated under the EU Birds Directive. Examples include some Irish peatlands
SPC	Strategic Policy Committees
SPSVs	Small public service vehicles such as taxis, hackneys and limousines
SRCCL	IPCC Special Report on Climate Change and Land due for publication in August 2019
SR 1.5	*IPCC Special Report on Global Warming of 1.5°C*
TEA	Tipperary Energy Agency
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WMO	World Meteorological Organisation
White Paper	*White Paper on Ireland's transition to a low carbon energy future 2015-2030*