https://www.friendsoftheirishenvironment.org/

Climate Division – Carbon Budgets
Department of the Environment, Climate and Communications,
29-31 Adelaide Road,
Dublin,
D02 X285
3 February, 2022

carbonbudgetconsultation@decc.gov.ie.

PUBLIC CONSULTATION ON IRISH CARBON BUDGET PROGRAMME 2021-2035

Dear Sir or Madam;

FIE endorses the arguments made in the four statements provided to the Joint Oireachtas Committee on Environment and Climate Action hearing on January 12, 2022, to inform your consideration of the Adoption of the first Irish Carbon Budget Programme, 2021-2035. We would be grateful if you consider those arguments to be considered as FIE's submission to the consultation and attach them to this single page letter: These statement/submissions are by:

- Professor Barry McMullin, Faculty of Engineering and Computing, Dublin City University
- Emeritus Professor John Sweeney Maynooth University
- Professor Kevin Anderson (PhD, CEng, FIMechE) Chair of Energy and Climate Change, School of Mechanical, Aerospace and Civil Engineering, University of Manchester Tyndall Centre for Climate Change Research
- Dr. Andrew Jackson, University College Dublin's Sutherland School of Law

Kind regards,

[redacted]

Friends of the Irish Environment is non-profit Company Limited by Guarantee and a Charity registered in Ireland. It is a member of the European Environmental Bureau and the Irish Environmental Network. Registered Office: Kilcatherine, Eyeries, Co Cork, Ireland. P75 CX53 Company No. 326985. Charities Registration No. 20154530 Revenue Charities Tax Exemption CHY 22294
Tel & Fax: 353 (0)27 74771 Email: admin@friendsoftheirishenvironment.org
Trustees and Directors: Kieran Cummins, Caroline Lewis, (UK), Tony Lowes, Ian Lumley, Judy Osborne (UK)

Adoption of the first Irish Carbon Budget Programme, 2021-2035

Opening statement for the Oireachtas Joint Committee on Environment and Climate Action

Professor Barry McMullin
Faculty of Engineering and Computing
Dublin City University

12th January 2022

I thank the Joint Committee for the opportunity to provide evidence on the crucial subject of Ireland's first statutory carbon budget programme, under the 2021 Climate Act. I am a Professor in the Faculty of Engineering and Computing at DCU, researching national energy system decarbonisation. My comments will focus primarily on the statutory requirement for the carbon budget programme to be consistent, in both design and execution, with the Paris Agreement, and specifically the commitment to quantitative limits on global temperature rise, achieved on a basis of *equity* and informed by the *best available science*.

Under the Act, the Climate Change Advisory Council have proposed the initial programme of three five-year carbon budgets (with the third on a provisional basis). It is now up to the Oireachtas, informed by the views of this Committee, either to adopt these budgets as proposed or to revise them on some specified grounds. My view is that the candidate budgets proposed by the Council should be regarded as *absolute maxima*; and that the Committee should give serious consideration to revising them *downward significantly*. This is based on multiple lines of argument, which I will outline as briefly as possible.

The current Programme for Government committed explicitly to an "average" reduction in total emissions of 7% per year over the period 2021-2030. Using the baseline of 2018 emissions specified in the Act, this would allow a cumulative 10-year total of **468 $MtCO_2eq$**; whereas the Council's proposal is for **495 $MtCO_2eq$**, cumulatively equivalent to an annual reduction rate of just under 6% per year. While the Programme for Government properly fell outside the formal legal scope of the Council process, it is surely still relevant to the deliberations of this Committee and of the Oireachtas. Accordingly, I suggest that the Committee should consider revising down the first two proposed budgets by a combined amount of ***at least* 27 $MtCO_2eq$** to align them with the Programme for Government. Note that the Committee should resist deflection into a narrow focus on the projected annual emissions level in 2030: this is simply not equivalent to the original Programme for Government commitment on any good faith basis of "best available science".

Separately, as explicitly required by the Act, the Council have assessed their proposed budget programme for consistency with the Paris Agreement. They have emphasised that this assessment depends not just on the budgets themselves, but on how they are allocated between sectors (which strongly affects the *relative* mitigation of different greenhouse gases), and on unavoidable value judgements required to interpret the obligations of the Agreement. While they concluded that their proposed budget programme is "broadly consistent" at least with the temperature goals of the Agreement, they were also clear that their assessment represented only a *minimal* test of Paris consistency; and took the position that the judgements involved ultimately go beyond the remit of the Council. It is therefore proper that this Committee should now make its own assessment and determination on all these issues.

A key aspect of this is *relative historical responsibility* for climate change, and the need to treat this on an equitable basis between countries: those with greater historical responsibility have a correspondingly greater obligation to act. This is a complex issue but directly affects the assessment of carbon budget consistency with the Paris Agreement through the choice of a *reference year* for temperature increase. In effect, differentiated historical responsibility is waived for all emissions before this reference year. In their assessment the Council adopted a reference year of 2020, but without offering any explicit rationale for this. In previous work with colleagues at DCU and TCD I have argued that 2015 should be regarded as the latest defensible reference year for this purpose, being the year when the Paris Agreement was adopted. Indeed, there is a good case for extending further back, even to

1992, when the UN Framework Convention on Climate Change was agreed. Since the Council published their budget proposals I have initiated, with DCU colleagues, independent analysis of the effect of varying the reference year. Preliminary results indicate that, using the Council's own methodology, but with a reference year of 2015, all but one of the scenarios considered by the Council would then *fail* the Council's own test for Paris Agreement consistency, strongly indicating a need for further reduction in the proposed budgets to adequately align with the intentions of the Act.

Next, regulations issued under the Act currently direct that certain emissions should be omitted from the carbon budget framework, namely those arising from international aviation and shipping. These are significant for Ireland, amounting annually to just under 4MtCO_2eq in 2018, primarily in aviation. However the fact that *accounting* for such emissions falls outside the budget framework does *not* mean they can be simply ignored in the setting of the budgets themselves. On the contrary: as already noted, the budget process is required to operate on a basis *consistent* with the Paris Agreement. Recent independent legal analysis, commissioned by the Brussels-based Transport and Environment NGO, is unequivocal that such emissions fall within the scope of the Paris Agreement. Accordingly, they must still be provided for *in some way* in the national budget process prescribed by the Act. The Council appear to have taken the view that this particular aspect of Paris consistency fell outside the scope of their assessment. On that basis, it therefore falls to this Committee to make such provision. Again, this indicates that the proposed budgets should be reduced, *at least* by the projected national share of such international aviation and shipping emissions. A *minimum* estimate of this would be **40MtCO_2eq** over the period 2021-2030.

A further critical consideration is *prudence,* as explicitly expressed in the Framework Convention through the precautionary principle. The Council's Paris test focused on the lower temperature goal of the Paris Agreement, namely limiting to no more than 1.5°C increase compared to pre-industrial conditions. This was very proper in the light of the IPCC Special Report on Warming of 1.5°C indicating rapidly escalating risks of severe global disruption as this threshold is exceeded. However, the relationship between that temperature limit and the permissible global GHG budget is still subject to very significant scientific uncertainty. It appears that, in effect, the Council adopted a budget based on just a 50% probability of meeting this temperature goal; i.e., no better than a coin toss. I urge the Committee to explicitly consider whether this represents an adequately prudential approach; if not, then the Irish budgets should be further reduced to reflect this.

It should be noted that the equity requirements of the Paris Agreement extend to at least the further dimensions of differentiated vulnerability and capacity to act; and arguably also to reparation for ongoing, severe, and highly unjust impacts of climate change. While the national claim on the global carbon budget is not the sole, or indeed the main, potential mechanism for responding to these issues, I would nonetheless urge the Committee to still bear them carefully in mind in assessing *overall* consistency with the Paris obligations.

Moving on from the immediate adoption of the carbon budgets, the next key step under the Act will be the division of these budgets across sectors, i.e., setting the sectoral emissions ceilings. As this is explicitly a Government responsibility, the Council properly refrained from prescribing any single sectoral breakdown, but did provide a set of five illustrative scenarios specifically exploring different potential divisions between the two largest emissions sectors, being agriculture and energy (including electricity, transport and heating). This was essential to inform their assessment of consistency with the Paris temperature goal: even though all these scenarios are designed to correspond to essentially the same aggregate carbon budget programme, as expressed in carbon dioxide equivalent emissions (CO_2eq), they differ

very significantly in their ultimate contribution to global warming. While the detailed interactions are complex, and will benefit from further scientific analysis, it is clear that the scenarios allocating relatively larger budget shares (or lesser emissions reduction) to the agriculture sector also correspond to greater absolute levels of warming, and therefore greater risk of failing the requirement of consistency with the Paris Agreement. I would urge the Committee to give early consideration to this issue, and offer relevant advice to the Government *in advance* of the setting of the sectoral emissions ceilings.

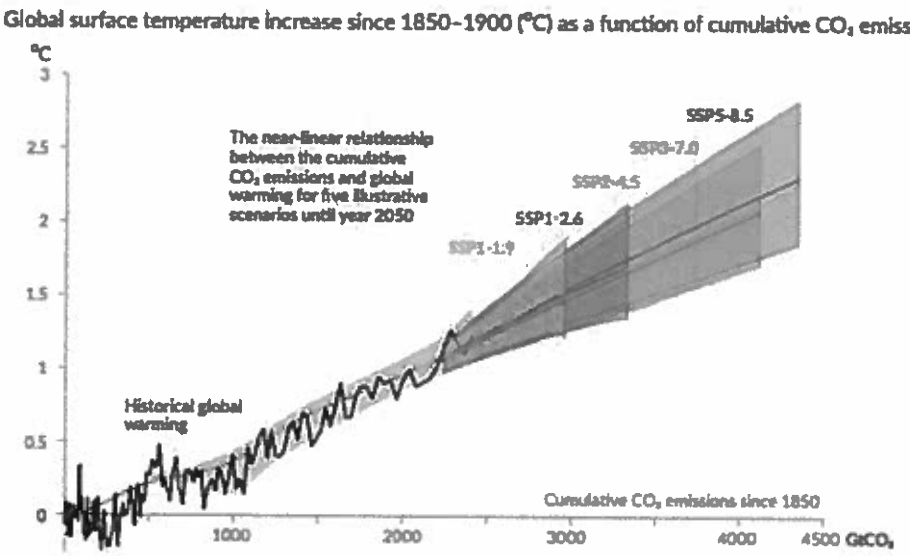
While adopting the national carbon budgets and corresponding sectoral ceilings are essential steps in Ireland's climate action their effectiveness will hinge on actual *delivery*. It is critical to recognise that, under the 2021 Act, carbon budgets are no longer mere "targets" to be "aspired to"; they are self-imposed *quantitative statutory constraints*, legally binding upon the state. This is a radically new and extremely challenging framework for our political and policy institutions. This is entirely justified by the scale and urgency of the climate emergency, but does now demand an urgent re-evaluation of our governance mechanisms to ensure that they are commensurate with this task. It is no longer a question of merely "doing our best": we must *do what is necessary*. In particular, there is a very strong case for the *early* establishment of mechanisms to dynamically regulate, as and when necessary, the upstream *inputs* to Irish societal activities, such as fossil fuels, that ultimately give rise to GHG emissions. This would effectively create a *backstop*, ensuring that carbon budget constraints would be reliably met, regardless of shortfalls in the effectiveness of other, less direct, measures. Given the overriding need for justice, equity, and national solidarity in these actions, this should be in the form of a system of *equitable rationing*. I have previously advocated for the deployment of one particular such system, known as Tradeable Emissions Quotas or TEQs. But whether through that approach or some other, I urge the Committee to consider this need for much stronger, transparent, and societally inclusive, national carbon budget governance at the earliest possible opportunity.

My final comment is in relation to the international dimension of climate action. Through the 2021 Act, and the implementation of its voluntary, nationally determined, carbon budget process, explicitly bound by the Paris Agreement goals, Ireland has sought to take a leadership role in modelling how the Agreement can be effectively delivered on. However, the harsh reality remains that, unless those countries responsible for the great bulk of emissions adopt similarly ambitious measures, *the Agreement will still fail*, with devastating consequences for current and future generations in all countries across the globe — including Ireland of course. As we celebrate the centenary of the establishment of the state, we can take some justified pride in our record, as a small independent nation, in advancing progressive multilateral action through active diplomacy. This was most recently manifested through our rapid mobilisation of diplomatic support from other EU member states during the ongoing BRexit process, and through our success in being elected to the UN Security Council for the 2021-22 term. I suggest that this Committee now initiate an urgent collaborative activity with the Committees on EU Affairs and on Foreign Affairs and Defence to consider how we can significantly upscale and *prioritise* Ireland's diplomatic effort on climate action so that our newly ambitious local efforts can make the maximum possible contribution to catalysing the required *emergency* global response.

Opening Statement

Emeritus Professor John Sweeney

Maynooth University



The 6th Assessment Report of the IPCC has confirmed that a strong linear relationship exists between cumulative greenhouse gas emissions and the rise in global temperature. This identifies the existence of a finite remaining carbon budget available to avoid warming beyond the dangerous climate change Paris Agreement limits of 1.5°C and 2°C above pre-industrial levels. The remaining carbon budget to have a likely chance of limiting warming to these levels equates to approximately 9 and 25 years respectively based on emissions at current levels. Global temperatures have already risen by 1.1°C since pre-industrial times and Irish temperatures have matched this quite closely, having risen by 0.9°C in the past 120 years, much of this having occurred in the period since 1980.

Article 2 of the Paris Agreement commits Ireland to pursuing efforts to limit the global temperature increase to 1.5°C above these levels. The Agreement also binds signatories to an implementation that reflects 'equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances'. Recent work suggests that Ireland's 'Fair Share' of the remaining global carbon budget will be exhausted within 3-5 years.

The European Parliament in June 2021 set targets to reduce net EU emissions by 55% by 2030, from 1990 levels, and eliminate net emissions by 2050. The 2030 target has been provisionally agreed between the Parliament, Commission and Council. Though commensurate with the Climate Action and Low Carbon Development (Amendment) Act 2021, the budgets to 2030 proposed by the CCAC currently provide for a reduction over 1990-2030 of less than 45%, an aspect that will be dealt with by other contributors.

National Carbon Budget

The Climate Change Advisory Council's proposed 5-yearly Carbon budgets ((295/200/151 Mt CO_{2eq}) are consistent with emissions in 2018 of 68.3Mt CO_{2eq} reducing to 33.5Mt CO_{2eq} in 2030, thus allowing compliance with the 51% emission reduction target. Several issues of timing arise, however:

1. The average annual percentage reduction required in the first compliance period is 4.8%, as opposed to 8.3% in the second. This means that any slippage in the period 2021-2025 will require an extremely onerous reduction in 2026-2030. A significant risk of this occurring exists, since Action 7 of the Climate Action Plan (CAP 22) does not envisage the incorporation of the legally adopted national and sectoral budgets in the plan until Q4 2022, i.e. until 40% of the current 5-year budget has elapsed. A failing trajectory over the next 5 years will undoubtedly result in litigation similar to what has been seen elsewhere in the EU.
2. Each year, and specifically for 2022, the Climate Change Advisory Council is obliged to report by 30 October and to request of relevant Ministers thereafter a plan for corrective action should their

Sectoral Emissions Ceiling not be on target. Recommendations made to them by the CCAC will require their response within 3 months. This potentially takes corrective action proposals into 2023, and beyond the time when the 2022 Climate Action Plan has been formulated (Q4 2022). By early 2023 the five year budget period will be advanced to the point where corrective action to stay on budget may require radical short term actions not currently contemplated.

3. The time lag for the availability of national emissions data hampers the work of the CCAC and the preparation of the CAP updates. Provisional data for emissions in 2020 were published by the EPA in September 2021 and final figures for 2020 will only be submitted to the EU Commission in spring 2022. To provide a basis for the CCAC report and the CAP 2022 it is highly desirable that advance access be given to provisional 2021 data during summer 2022. The MoU between the CCAC and all relevant government Departments and Agencies of May 2021 forms an essential recognition of these aspects.

Given the uncertainties surrounding the first national carbon budget period, the justification for leaving the maximum reduction rates to the second budget period is not warranted under the Precautionary Principle (Article 191 of the Treaty on the Functioning of the European Union). The rejection of a linear reduction pathway on technical and feasibility grounds is not consistent with action to tackle an emergency situation. Radical annual reduction solutions, appropriate to an emergency situation, do exist in sectors such as transport and agriculture not requiring additional infrastructure or technology.

Sectoral Emissions Ceilings

Allocation of sectoral emissions ceilings is a political choice. The scientific and legal imperative is that ceiling allocations add up to the national carbon budget, compliance is monitored, and corrective action is taken annually through the revision of the Climate Action Plan. The main sectors for allocation are:

Agriculture

No of Farms 2020	% national emissions	Average income Dairy	Average income cattle rearing	Average income Cattle other	Average income Sheep	Average income Tillage
93,244	**37.1**	€74,249	€9,043	€15,023	€17,913	€32,100

52% of farm households have off-farm employment. 67% of farms have no debt. Emissions from agriculture are projected to increase by 3.0% over the period 2021-2030 under the With Existing Measures scenario.

Transport

Households with at least 1 car (2016)	Total vehicles (2019)	% national emissions	Average Household Income (national)
1,390,000	2,200,000	**17.9**	€51,458

Emissions from transport are projected to increase by 5.7% over the period 2021-2030 under the With Existing Measures scenario

Residential

Households	% national emissions	Average Household Income	Energy use: coal	Energy use: Peat	Energy use: oil	Energy use: gas	Energy use: renewables	Energy use: electricity
1,900,00	**12.3**	€51,458	6	6	42	19	3	24

52% of households have some form of debt. Emissions from the residential sector are projected to decrease by 24.1% over the period 2021-2030 under the With Existing Measures scenario

Energy

% national emissions	Renewable electricity
15.0	42.1%

Emissions from the energy industries sector are projected to decrease by 11.9% over the period 2021 to 2030 under the With Existing Measures scenario.

Manufacturing & Industry

% national emissions	Total Labour Force (includes services and all categories)
7.8	~2.25M

Emissions from the Manufacturing & Industry sector are projected to remain at the same level over the period 2021 to 2030 under the With Existing Measures scenario.

Conclusions

1. The allocation of sectoral budgets will primarily require substantial changes in agricultural and transport emissions. As the primary polluter, agricultural emissions reductions will determine the burden to be placed on the rest of society.

% Reduction in Agricultural Emissions 2021-2030	Remaining % Reduction Burden on other sectors (Transport, Residential, Energy, Industry, Waste)
51	51
33	60
15	80
10	??

Commitments from COP26 relevant to Sectoral Emission Ceilings

(i) *A total of over 100 countries representing 70% of the global economy and nearly half of anthropogenic methane emissions Countries committed to a collective goal of reducing global methane emissions by at least 30% from 2020 levels by 2030.*

Hypothetical Decrease in Agricultural Emissions by 2030		Hypothetical decrease in Methane Emissions by 2030	Consequent required decrease in remaining Agricultural Emissions by 2030
33%		10%	77%

2. Only an immediate policy change to ensure significant near-term and ongoing reduction in methane emissions can protect livestock agriculture from far more onerous, sudden and less planned mandatory and very rapid emissions reductions to meet carbon budgets.

(ii) Calls upon Parties to accelerate the development, deployment and dissemination of technologies, and the adoption of policies, to transition towards low-emission energy systems, including by rapidly scaling up the deployment of clean power generation and energy efficiency measures, including accelerating efforts towards the phasedown of unabated coal power and phase-out of inefficient fossil fuel subsidies, while providing targeted support to the poorest and most vulnerable in line with national circumstances and recognizing the need for support towards a just transition;

In 2019, the CSO estimated that €3.0 Billion was raised in energy taxes, €0.4 Billion was spent on environmental subsidies related to energy and emissions, and fossil fuel subsidies were €2.4 Billion. The 2021 Climate Action Plan targets the production only of a roadmap to transition away from fossil fuel subsidies by Q1 2024.

3. The production of only a roadmap in 2024 provides an over-lengthy delay in removing fossil fuel subsidies and this action should take place in 2022 with a view to incorporation in the 2022 financial budget and implementation commencing 2023.

4. As noted by the CCAC, a reduction in the application of Nitrogen would bring climate, biodiversity and water quality benefits and assist attainment of sectoral budget targets. Increased fertiliser usage continues to drive emission increases in N_2O, CH_4, NH_4 as well as reductions in water quality and biodiversity. Consideration should be given to the reduction of chemical Nitrogen in agriculture to 325,000t by 2025 and not 2030 as envisaged in Action 304 of the Climate Action Plan.

5. In reporting on their efforts to reach carbon neutrality and comply with relevant sectoral carbon budgets, firms should be obliged to account for Scope 3 emissions (supply chain) and include them in any assessment of expansion plans. Firms should be required by procurement policies to incentivise their suppliers to reduce their emissions where these occur within the jurisdiction.

Issues relating to timing, scope and implementation of key CAC climate actions, data availability, and policy slippage, currently render the attainment of legally binding carbon budget targets seriously at risk.

Submission to the Joint Committee on Environment and Climate Action

(hearing date: 12th January 2022)

"to inform their consideration of Ireland's carbon budgets"

Professor Kevin Anderson (PhD, CEng, FIMechE)

Chair of Energy and Climate Change,

School of Mechanical, Aerospace and Civil Engineering,

University of Manchester

Tyndall Centre for Climate Change Research

(submitted 10th June 2022)

1 INTRODUCTION

My name is Professor Kevin Anderson. I currently hold a joint professorship in energy and climate change at the School of Engineering at the University of Manchester, the Centre for Sustainability and the Environment (CEMUS) at Uppsala University (Sweden) and the Centre for Climate and Energy Transformation at the University of Bergen (Norway). Prior to moving to academia in the mid-1990s, I worked for a decade as an engineer, principally in the petrochemical industry and I am a chartered engineer and fellow of the Institution of Mechanical Engineers.

I have examined issues around energy and climate change for thirty years. I have been a member of the Tyndall Centre (the UK's leading interdisciplinary and academic climate change research centre) since 2001, an organisation where I have previously served both as the Deputy Director and Director.

I attended both weeks of Glasgow and Paris Climate Conferences (respectively COP26 and COP21), as a scientific observer, presenting at formal events and engaging with scientists, policy makers and media. In relation to the Paris Agreement, several scientific colleagues and I scrutinised the evolving drafts of the Paris text, making clear and public assessments during major press conferences. I was commissioned by *Nature* to provide a personal evaluation of the final text of the Paris Agreement.

All views contained within this statement are attributable solely to the me and do not necessarily reflect those of my wider researcher colleagues or associated organisations.

2 CONTEXT

Political background

At the November Glasgow COP26, the Taoiseach reiterated Ireland's commitment to *"play it's part"* in delivering the *"large-scale reductions in greenhouse gas emissions* [necessary to] *keep the possibility of limiting warming to 1.5 degrees alive."*

> *"To achieve our Paris goals, immediate, large-scale reductions in greenhouse gas emissions are essential. Unless we act now, we will not keep the possibility of limiting warming to 1.5 degrees alive.*
>
> *The scientists are playing their part, in helping us to understand the dynamics of climate change and in developing the technologies and responses we need to limit its effect.*
>
> *As political leaders, it is our responsibility to put the necessary policies in place.*
>
> *Ireland is ready to play its part."*

Similar recognition of the need to increase ambition to deliver on the 1.5°C framing of climate change has been forthcoming from a breadth of Irish policy makers (e.g. Eamon Ryan, Darren O'Rourke and Pauline O'Reilly), leading thinkers (Mary Robinson and Pope Francis) and institutions (from Oxfam to An Taisce).

Quantitative background:

- Even allowing for the global banking crisis and Covid pandemic, Ireland's emissions in 2020 are unchanged from those in 1990. In the intervening years Ireland's average annual emissions have been almost 20% higher than they were in 1990.
- Ireland has territorial emissions of carbon dioxide per capita that are around 17% above the average for the EU27.
- In 2019 (latest year for comparative data) a typical Irish citizen had a total carbon footprint (i.e. a consumption-based emissions value) 27% higher than an average Chinese citizen, 75% above the global mean, and over ten times higher that of a typical African person.
- In 2020 Ireland's GDP per capita (in purchasing power parity, PPP) placed it as the world's third richest country. It has a PPP/capita value of over twice that for the EU, more than five times the Global average and sixteen times that of a typical African citizen.
- The population density of Ireland is around 70 people per square kilometre, considerably lower than the EU value of 117. In addition, Ireland has a very long coastline, an extremely favourable wind regime and high tidal ranges. Overall, Ireland is disproportionately well served for developing renewable energy.

My submission:

a) Takes the commitment of the Taoiseach (and wider Irish establishment) at face value

b) Is based on the carbon budgets provided in the IPCC AR6 report (2021)

c) Adopts a framing of equity aligned with the UNFCCC's core concept of "common but differentiated responsibility and respective capabilities"

d) Builds on the analysis outlined in a peer-reviewed paper: A factor of two (Anderson et al 2020)

3 ANALAYSIS

If Ireland's fair contribution to the 1.5°C commitment, reiterated in the speech of the Taoiseach, is to be realised, its mitigation policies need to be informed by a dispassionate analysis based on the latest carbon budgets (from AR6) and the equity criteria enshrined in CBDR-RC. Such analysis must eschew political sensibilities and not be constrained by ephemeral tenets of the economic status quo.

Whilst the following analysis focusses specifically on carbon dioxide emissions arising from energy use and supply, the role of wider emissions (principally agricultural emissions of methane and nitrous oxide) are key factors in estimating the size of the remaining carbon budget.

For this submission just two of the AR6 headline budgets values are considered. The first is the value for a 67% chance (or better) of not exceeding 1.5°C. This value is chosen to represent the ramping up of the 1.5°C ambition evident in the G7 Climate and Environment Ministers' communique (May 2021) and subsequently as the underpinning of the Glasgow COP26. This increase in ambition followed the IPCC's SR1.5 (2018) report in which the scale and scope of the difference in impacts associated with only a small change in temperature was emphasised (i.e. the impacts at 2°C compared with those estimated for 1.5°C). The second value is for a 50:50 chance of 1.7°C, chosen to represent the Paris Agreement's commitment to cut emissions in line with *"well below 2°C"* and *"pursue efforts to limit ... warming to 1.5°C"*. The carbon budget for a 50% of 1.7°C is almost the same as that for an 83% of staying below 2°C. AR6 gives these carbon budget values as, respectively, 400GtCO2 (hereafter the 1.5°C budget) and 850GtCO2 (hereafter the 2°C budget). Both of these budgets are for emissions starting in 2020.

Updating the budgets to January 2022 and making very conservative allowances for process emissions from industry (dominated by cement), leaves an 'energy only' global carbon budget of around 270GtCO2 for 1.5°C and a less onerous 680GtCO2 for 2°C. It is important to keep in mind that that the 2°C budget significantly increases the risks of far more devastating climate impacts. These will be felt initially by poorer and climate vulnerable communities elsewhere (typically both low-emitters and people of colour) and within a decade or so by our own children and grandchildren.

To give these budget values some high-level perspective, if current levels of emissions were to persist (and they are presently still on an upward trajectory) they would represent under eight years for 1.5°C and under nineteen years for 2°C. However, these are global values, and Ireland has signed up to mitigate emissions informed by the equity concept captured in CBDR-RC. Accordingly, if even a weak interpretation of CBDR-RC was to be adopted, then wealthy nations, such as Ireland, would have a much smaller carbon budget.

Provisionally, and based on the method outlined in the Factor of Two paper (linked above) and updated with AR6 carbon budgets and to the start of 2022, then Ireland's energy-only carbon budgets would range from, very approximately, 120MtCO2 (1.5°C) to 300MtCO2 (2°C). As noted, these are provisional estimates, and cover the period 2022-2100, and are for all energy CO2, including international aviation and shipping.

Another way of viewing these budgets is in terms of highly stylised emission pathways. At Ireland's current level of energy-only emissions (including an estimate for international aviation and shipping), it will consume its fair share of the global carbon budget for 1.5°C in a little over three years, and for 2°C, in a little over 8 years. If, however, Ireland was to immediately begin a simple straight line reduction from its current emissions to zero CO2, the time to zero fossil fuel emissions would extend to between 2029 (1.5°C) and 2038 (2°C). Alternatively, the budgets could be used to prescribe an exponential emission reduction pathway of between 12% p.a. (2°C) and 30% p.a. (1.5°C), assuming these reductions begin from this year (2022). Each year of delay, increase substantially these reduction rates, bringing forward still earlier the date of zero fossil fuels.

Why so different to other analysis

There are two key reasons why the carbon budget values and emission pathways presented here are much more onerous than those typically forthcoming from both global mitigation models and more detailed national models.

1) Virtually all global models adopt planetary scale uptake of 'carbon dioxide removal' (CDR), beginning in earnest in a decade or so from now, increasing in scale over time and continuing across and beyond the century. This ubiquitous assumption that future generations will remove from the atmosphere the emissions we have chosen not to mitigate is increasingly being brought into question. Whilst it certainly reduces significantly the level of mitigation demanded of today's policymakers, it does so at a very considerable risk to future generations. To give a sense of the scale of this assumption (dominated by technologies that are, at best, at pilot-scale): the level of emissions typically assumed to be removed from the atmosphere is not too far from the net level of CO2 absorption by total global photosynthesis. Put another way, it assumes an industry approaching the size of the current global oil and gas industry, from one that currently remains in its early infancy.

2) Within the national mitigation analysis and models of wealthier nations, equity (in the form of CBDR-RC and enshrined in the UNFCCC, and all subsequent international climate agreements), receives scant if any attention. Play out the implications of the carbon budgets explicit or implied in the mitigation polices of wealthier nations, and it is immediately evident that such nations allocate themselves a disproportionate quantity of the small and rapidly dwindling carbon budget (for both 1.5°C and 2°C).

My personal view on CDR, is that it should be the subject of a major programme of research and development. Moreover, if *'negative emissions technologies'* and so-called *'nature-based solutions'* can meet stringent ecological and social sustainability criteria, then they should be deployed. However, that they may work at scale in decades from now should not be relied on when developing today's mitigation polices. In terms of energy specifically, emissions need to reach real zero, not net zero. Ultimately, any absorption of CO2 through CDR will need to compensate for the warming from that residual element of agricultural emissions that cannot be eliminated. That said, even here agricultural emissions will need to be kept under very tight control, as the prospect of successfully and reliably removing hundreds of billions of tonnes of CO2 from the atmosphere and burying it somewhere securely remains highly speculative.

4 KEY CONCLUSIONS:

1) If Ireland is to meet its Paris climate commitments it has to limit its total emissions of energy-related carbon dioxide, i.e. its carbon budget, to between 120MtCO2 and 300MtCO2. The former is for a "likely" chance of staying below 1.5°C, the latter for a even chance of staying below 1.7°C (which equates to a very likely chance of below 2°C). These values are from the start of 2022.

2) If Ireland began an immediate cut in its emissions, such as to deliver a straight line mitigation path from today to zero emissions, then these budgets equate to reaching zero emissions by between 2029 and 2038. Another way of viewing this, is that 120MtCO2 equates to an annual mitigation rate of around 30% p.a., with 300MtCO2, much lower at a little over 12% p.a. These reductions include emissions from international aviation and shipping.

3) Whilst these conclusions for energy-based emissions are hugely challenging, they nevertheless are based on carbon budgets that rely on major and ongoing reductions in global emissions of non-CO2 GHGs. In Ireland's case, this plays out as a fundamental change in the nation's agricultural emissions of methane and nitrous oxide, requiring a profound rethink in Ireland's agricultural practices and consumption of meat and dairy.

4) There is no easy way out of the dilemma rich high emitting nations now find themselves in. We are here precisely because we have for thirty years been unprepared to face the climate challenges with honesty and integrity. Whether wealthy nations fail again now is a matter of choice – a choice where honesty and integrity are this time far more important than economic expediency and Machiavellian polices.

5 SUMMARY:

Ireland is an extremely wealthy nation, with a highly educated population and very favourable renewable energy potential. Moreover, it has a low population density that should make siting of renewable supply much less problematic than for most other nations. Despite Ireland's unique financial and geographical position to lead the world in renewable energy development, according to the Sustainable Energy Authority of Ireland, only 11% of its gross energy consumption is from renewable sources. Or put another way, around 90% of Ireland's total energy consumption is unsustainable. Ireland's failure to deliver any reduction in net emissions since 1990, despite its favourable financial position and geography suggests, thus far, that climate change has received no serious political attention. The unprecedented carbon budget challenges Ireland faces today stem, in part, from its own choice to ignore three decades of clear scientific analysis. Each year this failure to heed the science continues, so the mitigation challenge will increase. Ultimately, the physics of the climate will always beat any ephemeral economics that ignores it, with the subsequent climate impacts bequeathed to Ireland's own future and to more vulnerable communities elsewhere today.

Joint Committee on Environment and Climate Action

Consideration of carbon budgets proposed by the Climate Change Advisory Council

---

Written statement of

Dr. Andrew Jackson

UCD Sutherland School of Law

For meeting on 12 January 2022

---

1. My apologies to the Committee for being unable to give oral evidence today. I would like to focus here on two points: the Climate Change Advisory Council's (CCAC) legal obligations in preparing and proposing carbon budgets; and the Minister and Government's obligations in considering, amending, finalising, and approving carbon budgets.

2. In my opinion, CCAC has not complied with its legal obligations in preparing and proposing carbon budgets under s.6A of the Climate Action and Low Carbon Development Act 2015 (as amended)(the Climate Act). As detailed below, the Minister and Government are under similar obligations, via s.3(3), in considering, amending, finalising, and approving carbon budgets and sectoral emissions ceilings. The Minister and Government should not make the same mistake as CCAC here and may comply with their legal obligations by approving carbon budgets (and within this overall ceiling, sectoral emissions ceilings) that are significantly smaller than those proposed by CCAC.

CCAC

3. Under s.6A(9)(a) of the Climate Act, CCAC must carry out its functions under s.6A (Preparation of carbon budgets) in a manner that is consistent with the ultimate objective specified in Article 2 of the UNFCCC and the matters specified in subparagraphs (i) and (ii) of section 3(3)(a). Subparagraph (ii) of

section 3(3)(a) refers to *"the steps specified in Articles 2 and 4(1)"* of the Paris Agreement.

4. The ultimate objective specified in Article 2 of the UNFCCC is *"stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system"*.

5. The Paris Agreement (per its Article 2) aims to enhance the implementation of this UNFCCC objective. Article 2 of the Paris Agreement contains the following steps of relevance:

    a. Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change; and
    b. Implementing the Paris Agreement *"to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances."*

6. In turn, Article 4(1) of the Paris Agreement requires Parties to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.

7. The Committee will note that both Articles 2 and 4(1) of the Paris Agreement refer to the need for action to be taken based on *equity*. Elsewhere, the Paris Agreement specifically obliges developed country Parties such as Ireland to *take the lead* by undertaking economy-wide absolute emission reduction targets (Article 4(4)).

8. In addition to the obligations on CCAC to perform its functions consistently with equity, common but differentiated responsibilities, etc., CCAC must separately, under s.6A(9)(b), have regard to climate justice in performing its functions under s.6A. There is clearly some overlap between s.6A(9)(a) and (b),

with the obligation to perform functions consistently with various matters under s.6A(9)(a) representing a stronger obligation than the *"have regard to"* obligation under s.6A(9)(b).

9. In its Technical Report on Carbon Budgets of October 2021, CCAC states (at p.8) that *"An appropriate contribution to the Paris Agreement is an appropriate response to international climate justice."* On the question of what this appropriate contribution should be for Ireland, CCAC states (at p.72; emphasis added):

> *"In its deliberations, the Committee considered the question of what Ireland's appropriate contribution would be to the global effort to reduce greenhouse gas emissions.* ***Any such determination has implicit or explicit implications around climate justice, historical responsibility, equity and equality. It is not the job of the Council or the Carbon Budget Committee to make such value judgements.*** *The Committee concluded that Ireland's carbon budgets for the periods 2021- 2025, 2026-2030 and 2031-2035 must at least be consistent with the temperature goals of the Paris Agreement; the 'Paris Test', developed by the Secretariat under the guidance of the Carbon Budget Committee. This approach makes the lowest number possible of implicit assumptions."*

10. Contrary to the words in bold/underlined above, CCAC is *specifically required by law* (s.6A(9)(a) of the Climate Act) to carry out its functions in a manner consistent with implementation of the Paris Agreement *"to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances."* Explicitly excluding such considerations is, in my view, a fundamental legal flaw in CCAC's approach. CCAC is obliged by s.6A(9)(a) to act consistently with, inter alia, *all of* Article 2 of the Paris Agreement. In focusing solely on the temperature goals of the Paris Agreement (Article 2(1)), while excluding consideration of equity and the principle of common but differentiated responsibilities and respective capabilities (Article 2(2)), CCAC's 'Paris Test' is not a 'Paris *Compliant* Test'.

11. Having thus abandoned consideration of equity and historical responsibility on the ground that such consideration is not its job, CCAC summarises its process (at p.75) as follows:

"Assessing entitlement or 'fair shares' are ethical and political judgements that can be fraught with difficulty. This [CCAC's] 'Paris test' takes a different approach to consider what the temperature outcome would be if every country in the world, 1) had the same starting point as Ireland and 2) reduced emissions in the same speed and amount. In other words, on a per capita basis, we scale up Irish emissions to the global level. Different approaches could be taken (Price 2021, Smith 2021). This approach does not take into account previous actions nor does it take into account feasibility or cost."

12. It is worth noting in this regard that:

    a. Every country in the world does not have the same starting point as Ireland (Ireland has amongst the highest per capita emissions globally and has benefited from its past high emissions);
    b. Climate change is an issue of *cumulative emissions* since the industrial revolution, so failing to *"take into account previous actions"* ignores historical responsibility (NB. that previous actions can justifiably be excluded in this way is an *"implicit assumption"* apparently overlooked by CCAC in its stated attempt to minimise such assumptions);
    c. Every country in the world does not have the same capability to reduce emissions in the same speed and amount. Nor are the costs the same.

13. CCAC appears to have been aiming for some kind of scientific 'value-neutrality' where this is not possible and where this runs counter to its legal obligations. That is, having stated that CCAC does not want to engage in *"value judgements"* about climate justice, historical responsibility, equity and equality, CCAC proposes a calculation method that is self-evidently not neutral on these issues: avoiding addressing questions of historical responsibility and equity does not amount to staying neutral on such questions. As part of its deliberations, CCAC received excellent papers on effort sharing by its research fellows, Smith (2021) and Price (2021, plus addendum). These identify and discuss different approaches to sharing out the remaining global carbon budget. At pp.4-5, for example, Smith (2021) provides a table summarising seven different approaches to sharing out the global carbon budget, with a commonly-used method (*"grandfathering"*) said to be *"generally viewed as morally unacceptable"* (citing Giraud et al, 2017), for example. However, when it comes to justifying its own approach, CCAC simply states *"Different approaches*

could be taken (Price 2021, Smith 2021)"; it notes that its own approach *"does not take into account previous actions nor does it take into account feasibility or cost"*; and it claims, without justification, that its approach *"makes the lowest number possible of implicit assumptions."* In a note that appears to have formed the basis for CCAC's adopted approach, the CCAC Secretariat describes the approach of scaling up Ireland's emissions profile to the global population as *"highly simplistic"*.

14. A recent article[1] authored by many of climate justice's leading scholars makes criticisms that can be transposed directly to CCAC's approach: *"As there is no ethically neutral position in the climate context, pretending to be value-free obscures unconscious biases under a veneer of neutrality, particularly in quantitative modelling. Analysis may be rigorous, replicable and systematic, but it should also explicitly outline normative assumptions and values within the specific political landscape of climate equity debates. Transparency about values enables all users to place the analysis in the context of other work and evaluate it accordingly."*

15. In its Technical Report on carbon budgets, CCAC itself concludes (at p.75) *"that the proposed carbon budgets are broadly consistent with the legislated criteria regarding the UNFCCC and the Paris Agreement"*. I do not agree, and in any event, *"broad consistency"* is not what CCAC should be aiming for when it comes to its legal obligations under the Climate Act.

16. To be clear: CCAC could have tried to construct an argument to the effect that its method for proposing carbon budgets was somehow consistent with equity and common but differentiated responsibilities and respective capabilities. It did not do so. The legal flaw is that it *explicitly excluded* such issues from its consideration, despite the clear obligations in s.6A(9) of the Climate Act. As Dooley et al (2021) conclude, *"analysis [of equity in the climate context] should inform, rather than supplant, the political process"*. The carbon budgeting process under the Climate Act is specifically designed to ensure this: CCAC proposes budgets, which are then to be considered, potentially amended, and ultimately approved by the Government, with input from the Oireachtas. Within this framework, there is no danger of CCAC supplanting the political process in

[1] Dooley et al (2021) Ethical choices behind quantifications of fair contributions under the Paris Agreement, Nature Climate Change 11: 300-305.

complying with its obligation to act consistently with considerations of equity and common but differentiated responsibilities in proposing budgets.

The Government and Minister

17. As noted above, the Government and Minister should avoid making the same legal error in considering, amending, finalising, and approving carbon budgets. As stated above, to comply with their legal obligations, in my view the carbon budgets should be significantly reduced in size before being approved. Like CCAC, the Government and the Minister, via section 3(3) of the Climate Act, must exercise their carbon budgeting functions consistently with the UNFCCC and Paris Agreement obligations set out in paragraphs 4-6 above.

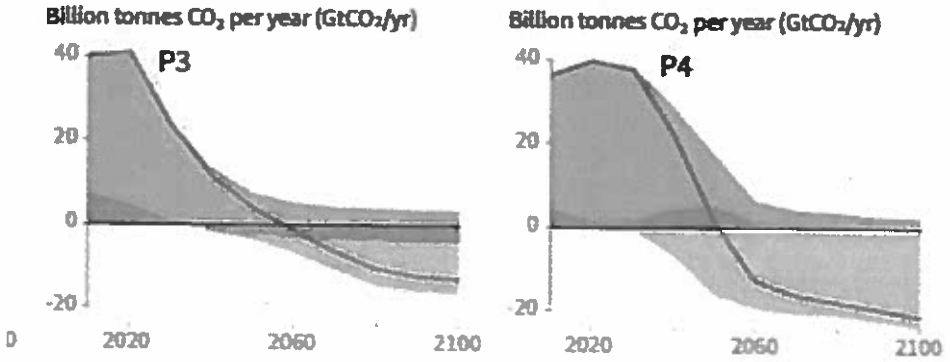
18. As the Committee will be aware, the Government committed in the Programme for Government to *"an average 7% per year reduction in overall [...] emissions from 2021 to 2030 (a 51% reduction over the decade) and to achieving net zero emissions by 2050."*

19. The 7% per annum reduction figure had its origins in a 2019 UNEP report, which said that, on *global average*, a 7.6% emissions reduction per year would be needed between 2020 and 2030 for a 66% chance of limiting heating to 1.5°C.

20. Note four things: First, the Government opted for a target in the Programme for Government (7%) that is *below* UNEP's global average. Secondly, UNEP states in respect of its 7.6% annual reduction figure (starting in 2020) that *"Evidently, greater cuts will be required the longer that action is delayed."* Since emissions have not reduced since 2020, the 7.6% global average figure is now out of date and needs to be increased. Thirdly, and very importantly, UNEP's 7.6% figure is predicated on vast so-called negative emissions – that is, the need to somehow remove >200 Gt of CO_2 globally from the atmosphere by the end of this century (see "Below 1.5°C in 2100 scenario" on p.23 of UNEP's report). We have no plan for this globally or nationally, and the IPCC notes that it is a *"major risk"* in seeking to limit heating to 1.5°C. CCAC highlighted these assumed large-scale negative emissions in its recent Annual Review 2021, noting in this regard that the State has not yet delivered its Long-term climate strategy to the European Commission, now more than two years after the legal deadline of 1 January 2020. Fourthly, the Climate Act targets and CCAC's proposed carbon budgets do not cover emissions from international aviation

or shipping, despite the fact that these are within the scope of the Paris Agreement.

21. The public debate seems to have focused almost exclusively on how Ireland's commitment to reduce emissions by 2030 might be achieved. However, given that Ireland's 2030 target assumes massive negative emissions later in the century, the public debate (and the Committee's current work) should surely *also* engage *now* with how Ireland's share of this can and will be achieved. The current *assumption* is that a large part of this (e.g. the area shaded in yellow below in two of the IPCC's illustrative model pathways from its Special Report on 1.5°C)[2] could perhaps be achieved by so-called Bioenergy with Carbon Capture and Storage (BECCS): that is, planting millions or billions of trees to sequester carbon; burning the wood in power plants and capturing and storing the carbon released. Numerous questions immediately arise: e.g. where will these trees and power stations go in Ireland, what would the impacts of such planting, felling, and power plant construction/operation be, and anyway where is the evidence of planning *now* for this at the required scale (forests take decades to establish, after all)?



P3: A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

P4: A resource- and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

[2] The brown areas represent removals in the Agriculture, Forestry and Other Land Use (AFOLU) sector.

22. Focusing just on agriculture and land use emissions, based on historic and projected emissions from these sectors from the EPA, CCAC stated in its recent Annual Review 2021 that *"By 2050, carbon dioxide removals of 26 Mt CO_2 eq balance the projected residual emissions. Land-use in Ireland is currently a net source of emissions. Significant progress in the implementation of action to reduce or eliminate emissions and to enhance removals, including afforestation, is required in the near term in order to realise removals in the longer term.* ***It is not clear how removals at this scale would be achieved, and would almost certainly involve the deployment of novel technologies."*** Figure 6.2 of the Annual Review illustrates the scale:

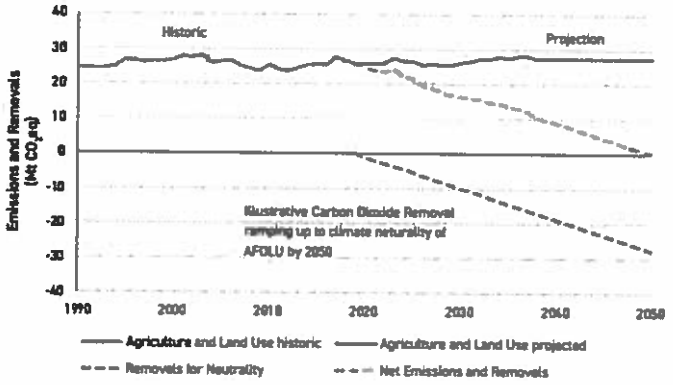


Figure 6.2: *GHG emissions from agriculture and LULUCF including an illustrative pathway for removals to achieve neutrality by 2050*[147]

23. Note that this figure of 26 $MtCO_2$ eq to be removed *each year* (by 2050, just 28 years from now) to achieve climate neutrality from the agriculture and land use sectors alone is equivalent to about 40% of Ireland's total emissions in 2018. How (even broadly) would this be achieved? In its Technical Report on carbon budgets, CCAC concludes *"it is clear that forest plantation rates need to significantly increase and that preparations need to be made for negative emissions technologies."* But how does one prepare for technologies that do not exist or do not exist at scale? The Committee surely needs an answer to these sorts of questions as part of its current work. While not all of the required removals are to be delivered over the life of the first three carbon budgets, these budgets nevertheless assume that very large-scale negative emissions will be achieved by Ireland in time. How?

24. CCAC's Technical Report (at p.86) cites Price (2021) to the effect that a *cumulative total* of 200 $MtCO_2$ by way of removals *"would represent a challenging*

but feasible assessment for planning and budgeting purposes" in Ireland,[3] with the ability of land use removals reportedly saturating at 100 $MtCO_2$, the other 100 $MtCO_2$ presumably to be achieved by unknown *"negative emissions technologies"* (which will (need to) become *"more prominent in the long term"* according to CCAC). Note that a need to remove 26 $MtCO_2$ eq per annum on an ongoing basis to achieve carbon neutrality in the agriculture and land use sectors in Ireland, as envisaged in the figure above, is incompatible with an available *cumulative* total of 200 $MtCO_2$ in removals potential. That is, the removals needed to balance (or 'net zero') the projected level of agricultural and land use emissions from 2050 onwards would use up Ireland's entire carbon removals potential within 8 years. These sorts of discrepancies or mismatches between the amounts of carbon needing to be removed and the amounts it will be practically possible to remove led McMullin et al (2020) to conclude that *"much more ambitious, near-term reduction of gross CO_2 emissions remains the most urgent policy priority."* Conforming with the cumulative removals ceiling of 200 Mt CO_2 cited by CCAC would, according to McMullin et al, *"imply the achievement of national net-zero territorial CO_2 emissions by about 2035–2040, i.e. much earlier than the currently "most ambitious" net-zero target of about 2050."*

25. In summary, if we do not have good answers *now* as to:

    a. how much the Government is planning to achieve by way of CO_2 removals (NB. as noted above, the State has not produced the required Long-term climate strategy that would reveal this, despite an EU law deadline of 1 January 2020);
    b. whether this exceeds the amount assumed to be achievable;
    c. how and when the required scale of removals can and will be achieved; and
    d. how in practical terms the Government is planning for this *now*,

    in my view the Government/Oireachtas cannot fairly burden younger and future generations with achieving such removals by approving the carbon budgets proposed by CCAC (or anything like them). In terms of Climate Act obligations, approval in such circumstances would appear inconsistent with the principle of (intergenerational) equity.

[3] See McMullin et al (2020), which makes it clear that 200 $MtCO_2$ is a cumulative total.

26. To my mind it is vital that people know now that vast carbon dioxide removal, including from *"novel technologies"*, is 'priced in' to our targets and proposed budgets. Understanding this makes it clear why we cannot delay very deep and rapid emissions reductions now in the hope that future technologies will somehow magically save us later – the Programme for Government's 7% per annum target to 2030 is *already counting on this magic happening later.* As Naomi Klein puts it in her book *This Changes Everything, "we are literally betting the habitability of the planet on the faint hope of a miracle cure."*

27. It is worth noting that using removals in other countries to offset Irish emissions will not prove a viable or equitable solution. In their recent report *"Not Zero: how 'net zero' targets disguise inaction"*, a coalition of international climate justice organisations states that *"There is simply not enough available land on the planet to accommodate all of the combined corporate and government 'net zero' plans for offsets and Bioenergy with Carbon Capture and Storage (BECCS) tree plantations…. By putting the burden for carbon sequestration onto land and tree plantations in global South countries […], most 'net zero' climate targets are effectively driving a form of carbon colonialism."*

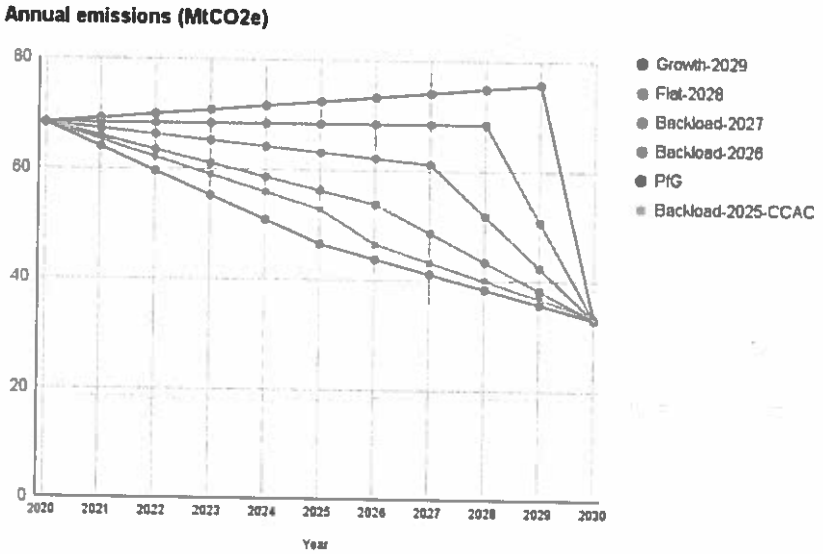
28. As Professor Kevin Anderson et al noted in a recent peer-reviewed paper, *'If…the mitigation agenda of 'developed country Parties' is determined without reliance on [highly speculative] planetary scale [negative emission technologies][4] and with genuine regard for equity and 'common but differentiated responsibilities and respective capabilities', the necessary rates of mitigation increase markedly.'* In Ireland's case, Professor Anderson emphasised in earlier evidence before this Committee the need for Ireland to achieve at least an 80% cut in CO_2 emissions by 2030 (compared with 2018); the need to reach full decarbonisation of Ireland's entire energy system (including aviation and shipping) by 2035-40; and the need to cut total agricultural methane and nitrous oxide emissions by at least 3%, year on year. Yet even this is based on a global carbon budget that gives only a 33% chance of staying below 1.5°C,[5] and our Climate Act does not aim to achieve anything like these reductions. Nevertheless, in my view the principle of equity points towards calculating Ireland's carbon budgets in the manner Professor Anderson suggests: that is, without reference to speculative future carbon removals/negative emissions technologies.

---

[4] Which the authors define to include *inter alia* removals by way of BECCS.

[5] See Anderson et al (2020) A factor of two: how the mitigation plans of 'climate progressive' nations fall far short of Paris-compliant pathways, Climate Policy 20(10): 1290-1304.

29. In summary, a 7% per annum (average) reduction in emissions (amounting to a 51% reduction in annual emissions by 2030 compared to the 2018 level) is clearly insufficient for Ireland on the basis of equity (being lower than UNEP's suggested global average), and assumes very large-scale speculative negative emissions (infringing the principle of intergenerational equity). However, as noted elsewhere by Professors Barry McMullin, John Sweeney and the present author, the Climate Act did not in fact require the achievement of an average 7% reduction per year by 2030, despite the Programme for Government commitment. Instead, the Act sets no upper limit on the carbon budgets that CCAC can propose to 2030. And indeed, CCAC has in fact proposed budgets that amount to an average reduction of just less than 6% per annum. All pathways on the figure below (courtesy of Professor Barry McMullin) are notionally consistent with s.6A(5) of the Climate Act because annual emissions in 2030 are -51% vs annual emissions in 2018. However, the associated carbon budgets (the area 'under the line' in each case) vary widely. The light blue line (Backload-2025-CCAC) equates to the budgets proposed by CCAC; the orange line (PfG) equates to the budgets implied by the Programme for Government commitment. The first two proposed budgets (to 2030) would need to be reduced by a combined amount of at least 27 $MtCO_2$ eq to meet the Programme for Government commitment.



30. The Committee may have seen claims that Ireland's 2030 target is amongst the most ambitious in the world, and may perhaps be tempted to view the

proposed carbon budgets in this light. However, it is important to avoid falling into the trap of shifting baselines. Starting from Ireland's 2020 (or 2018) level of emissions, the 2030 target indeed looks ambitious. But using the UNFCCC's standard 1990 baseline puts the ambition in better context: we are aiming to reduce our emissions by 44.5% in 2030 compared to the 1990 level (that is, from 60.37 Mt CO_2 eq in 1990 to 33.5 Mt CO_2 eq in 2030);[6] the EU collectively is aiming for a 55% reduction over the same period.

31. It is interesting to note in this regard that Germany's highest court - the Federal Constitutional Court - recently held in the *Neubauer* case that Germany's target of a 55% reduction by 2030 compared to 1990 infringed fundamental rights in the absence of a pathway to net zero in 2050. As the Court put it, *"one generation must not be allowed to consume large portions of the CO_2 budget while bearing a relatively minor share of the reduction effort, if this would involve leaving subsequent generations with a drastic reduction burden and expose their lives to serious losses of freedom."* Germany has since increased its target to a 65% reduction by 2030 compared to 1990, while Denmark has enshrined the highest target of all in the EU, at 70% between 1990 and 2030. Claiming that our 2030 target is amongst the most ambitious in the world (from 2018 or 2020 levels) is open to obvious criticism because it neglects the deep emission reductions others have made since 1990, while we have allowed our emissions to rise. To use a crude metaphor, picture a marathon runner joining a race three-quarters of the way through, then sprinting into the leading pack. Those who had been in the race since the start would justifiably regard the late-joiner's shouts of "look, I'm in second place"[7] with scepticism. (There are of course obvious limitations to this metaphor, including the fact that we are here discussing paper targets, while CCAC emphasised in its recent Annual Review that Ireland's climate targets are not yet translating into the necessary action.)

32. Legally, the Government is of course not bound to agree with CCAC's proposal of carbon budgets amounting to less than a 6% (average) reduction per year to 2030. The Government could and should approve budgets that are significantly smaller than this, reflecting considerations of equity and common but

[6] The stated figure for 1990 was obtained applying the same methodology as CCAC used to calculate the 2018 emissions baseline cited in its Technical Report; with thanks to Professor Barry McMullin for calculating the 1990 figure.

[7] Having already reduced its emissions by >30% between 1990 and 2018, Denmark has set a target for 2030 (relative to a 2018 baseline) that is higher than Ireland's 51%.

differentiated responsibilities and respective capabilities, and ignoring speculative removals/negative emissions, for example. In respect of emissions from international aviation and shipping, which are said to be outside the scope of the Climate Act, the Minister and Government (and CCAC before them) must nevertheless be able to justify, pursuant to s.3(3), how their approval (and proposal) of carbon budgets remains consistent with the objective of the UNFCCC and Articles 2 and 4(1) of the Paris Agreement (including equity and common but differentiated responsibilities and respective capabilities), absent inclusion of such aviation and shipping emissions.

33. I would note finally that the Climate Act is not the only relevant legal consideration in respect of the carbon budgeting process. Section 3(1) of the European Convention on Human Rights Act 2003 requires every organ of the State to perform its functions in a manner compatible with the State's obligations under the ECHR. Equally, constitutional rights are in play. If the Government were to approve the carbon budgets proposed by CCAC, this would amount to approving budgets for Ireland that:

    a. aim to achieve less than 6% per annum (average) emissions reductions by 2030, where UNEP has advised that a global average reduction of 7.6% per annum from 2020 to 2030 is necessary (assuming massive negative emissions);
    b. do not reflect Ireland's fair share contribution, where the Dutch Supreme Court in *Urgenda* has held that every country must do "its part" to comply with ECHR obligations (an interpretation that seems likely to be confirmed in one or more of the climate cases pending before the European Court of Human Rights); and
    c. are based on a 44.5% reduction in emissions in 2030 (compared to the 1990 level), in the absence of a pathway of reductions to carbon neutrality in 2050, in circumstances where Germany's highest court has recently found an infringement of fundamental rights based on a (higher) 55% target for 2030 (compared to 1990) and similarly no pathway to net zero by 2050.

In my view, significantly smaller carbon budgets than those proposed by CCAC are required to protect and vindicate fundamental rights and to comply with the Climate Act.