

Submission to the Public Consultation on Carbon Budgets

[Department of the Environment, Climate & Communications]

8 February 2022

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Submitted in our capacity as independent researchers
at Dublin City University

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Executive Summary

In this submission¹, as per the scope of this Consultation, we present recommendations and supporting evidence regarding the economy-wide carbon budgets proposed by the Climate Change Advisory Council (hereafter, the Council) and respond to the Minister's specific requests.

Key recommendations

1. **Downward revision of carbon budgets is indicated:** The Minister and Government should consider revising down the first 2021–2030 budget total by *at least* 27 MtCO₂eq to no more than 468 MtCO₂eq, to align with the commitments contained in the *Programme for Government*.
2. **Paris Agreement:** The carbon budgets should be *critically assessed* for consistency with the Paris Agreement Article 2 goal, as required under the Climate Act:
 - a. **Historic Responsibility:** In our analysis, using the Council's own methodology but with a reference year of 2015, all but one of the Council's scenarios would fail the Council's test for Paris Agreement consistency, indicating further downward budget revision.
 - b. **Provision for emissions from international Aviation and Shipping:** A *minimum* corresponding carbon budget reduction would be 40MtCO₂eq over the period 2021-2030.
 - c. **Prudence:** The Minister and Government should *consider* whether aligning carbon budgeting with only a 50:50 chance of limiting to 1.5°C is adequately prudential.
 - d. **Equity:** The Minister and Government should bear in mind equity and CBDR-RC considerations carefully in mind when assessing overall consistency with the Paris obligations.
 - e. **Socio-political "feasibility":** Making an explicit assessment of globally equitable carbon budgeting aligned with the Paris Agreement is the critical first step for carbon budgeting. Assessment of domestic socio-political "feasibility" in delivering corresponding GHG mitigation pathways is necessarily an important but *secondary* issue, as explicitly recognised in the Act.
3. **Methane mitigation strongly affects carbon budget warming:** Targeting early, deep and sustained reduction in agricultural annual CH₄ emissions is essential to Paris consistent carbon budgeting, even within a fixed multi-gas CO₂eq budget.

¹ This submission is substantially based on the opening statement made by Professor McMullin at the 12th January 2022 Joint Oireachtas Committee hearing:
https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_environment_and_climate_action/2022-01-12/debate/mul@/main.pdf

4. **Delivery of the Carbon Budgets:** The Act's reference to a "51% reduction" in annual emissions by 2030 refers only to the Council's role in making initial budget *proposals*. Now that those proposals have been made, this provision has no further legal force: there is not (and never was) any legal obligation on the *Government* to that narrow (and ineffective) target. Once adopted, it is the five-year carbon budgets *alone* that will be legally binding. Given the urgency inherent in meeting these budgets, *delivery and compliance* with these budgets will require a much simplified system of rapid reporting, assessment, and policy correction.
5. **Nitrogen budgets and land use are critical in carbon budgeting:** We estimate that *maximum* national targets of 325 ktN/yr by 2025 and 250 ktN/yr by 2030 for imported chemical nitrogen are needed to align with the carbon budgets.
6. **Ireland's international diplomacy is *extremely* important for climate action:** Ambitious national efforts must be supplemented by strong diplomatic effort to amplify the effect of targeting and achieving Paris-consistent five-year carbon budgeting.

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Supporting evidence for the recommendations

1. Downward revision of carbon budgets is indicated

The candidate budgets proposed by the Council should be regarded as *absolute maxima*; and the Minister and Government should give serious consideration to revising them downward significantly. This is based on multiple lines of argument:

- 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 MtCO₂eq; whereas the Council’s proposal is for 495 MtCO₂eq, cumulatively equivalent to an annual reduction rate of 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 the Government and of the Oireachtas.
- Accordingly, we suggest that the Minister and Government should consider revising down the first two proposed budgets by a combined amount of at least 27 MtCO₂eq to align them with the Programme for Government.
- Note that the Minister and Government 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” which depends on cumulative emissions, not the target year’s emissions.

2. Carbon budgeting consistency with the Paris Agreement

As explicitly required by the Act, the Council has assessed their proposed budget programme for consistency with the Paris Agreement using a “Paris Test” (Section 4.2 in their Technical Report). 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 the Minister and Government should now make their own assessment and determination on all these issues.

Key points that need to be considered for Paris consistency are as follows:

(a) *Historic Responsibility*.

A key aspect of Paris-consistency 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 TCD we 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 at DCU we have conducted independent analysis of the effect of varying the reference year. Preliminary results² indicate that, using the Council's own methodology, but with a "minimally equitable" reference year of 2015³: 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.

(b) Inclusion of Aviation and Shipping: The 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 (also known as *bunker emissions*, reported "below the line" in national emissions accounting). These are significant for Ireland, amounting annually to just under 4 MtCO₂eq 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 nation state responsibilities under 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.

² Working paper analysis will be published by March 2022 and is available on request.

³ In a peer-reviewed paper, [McMullin et al. 2019](#), the year 2015 is benchmarked as the "latest possible" basis for "minimally equitable" carbon budgeting because 2015 is the year of global political agreement at Paris and the year in which Nationally Determined Contributions were stated. Use of a later year (the Council uses 2020 globally and 2021 for the core scenarios) therefore requires explicit and referenced reasoning. Open access accepted article manuscript: <https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGN1LmlfGllLW5ldHN8Z3g6NzNlZDNjMGJmQTl4NWJkMw>

- **On that basis, it therefore falls to the Minister and Government 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 40 MtCO₂eq over the period 2021-2030.**
- (c) **Prudence:** As explicitly expressed in the UN Framework Convention through the precautionary principle defining prudence with a sufficient margin of safety is essential in avoiding dangerous climate change. 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.
- **We urge the Minister and Government to explicitly consider whether this represents an adequately prudential approach; if not, then the Irish budgets should be further reduced to reflect this.**
- (d) **Equity:** It should be noted that the equity and CBDR-RC ('common but differentiated responsibility and respective capabilities) requirements of the Paris Agreement and UNFCCC 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, we would nonetheless urge the Minister and Government to still give adequate consideration to these issues before finalising specific national budgets.**
- (e) **National socio-political "feasibility" is not an admissible consideration for Paris consistency:** It is important to understand that the Paris Agreement goal stresses the need to act in alignment with the temperature goal on the basis of 'best available science' with implementation 'on the basis of equity', respecting 'common but differentiated responsibility and respective capabilities'. Therefore, setting out a (carbon budget) test for Paris consistency needs to be explicitly defined in these *globally* equitable and prudent terms with clarity in regards to the above points (a)–(d).
- **Given that developed nations such as Ireland have agreed to act first and fastest, national or sectoral short-term socio-political feasibility concerns are therefore not admissible factors in defining an equitable Paris-consistent target threshold. Once**

such a threshold is explicitly defined, national and sectoral prioritisation then become relevant in examining alternate options to deliver carbon budgets and emission pathways aligned with a Paris-consistent carbon budgeting framework. It is important that this is understood and communicated by the Minister and Government in setting and delivering carbon budgets.

3. Methane mitigation strongly affects carbon budget warming

Following adoption of the overall 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 (CO₂eq), 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. It is essential to deliver substantial, early and ongoing reductions in agricultural methane to meet Paris-consistent carbon budgets for Ireland. Methane (CH₄) mitigation has a very important warming reduction effect in the Council carbon budgets.

- **Targeting early, deep and sustained reduction in agricultural annual CH₄ emissions is essential to Paris consistent carbon budgeting. Therefore, it is not legally or scientifically defensible to substitute CH₄ reductions through greater targeting of nitrous oxide (N₂O) mitigation instead on the basis of GWP₁₀₀ CO₂eq accounting, as is seen in the current Climate Action Plan (using Teagasc MACC measures).**
- **We would urge the Minister and Government to give early consideration to this issue *in advance* of the setting of the sectoral emissions ceilings.**

4. Delivery of the legally binding five-year Carbon Budgets

Adopting the national carbon budgets and corresponding sectoral ceilings are essential steps in Ireland's climate action, however, 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.

- **We identify⁴ that five-year carbon budgeting demands:**
 - (1) Simplified, faster CSO public reporting of key indicators of emissions drivers (ideally monthly): fossil fuel use in energy, cement manufacture, nitrogen usage in agriculture, and land carbon loss due to forest harvest and peat extraction;
 - (2) Comparison, at least quarterly, by the EPA or Council, of the implied emissions pathways from these drivers against the overall and sectoral carbon budgeting, especially with regard to individual sectoral pathways for CO₂, N₂O and CH₄ within the carbon budgets;
 - (3) Course correction, if needed, directed by the Cabinet Committee and set out the responsible Ministers and their Departments and reporting of reasoning to the
- Given the overriding need for justice, equity, and national solidarity in these actions, some system of equitable rationing of carbon budgets among citizens and over time is required. Professor McMullin has previously advocated⁵ for the deployment of one particular such system, known as Tradable Emissions Quotas or TEQs⁶.
- **But whether through that approach or some other, we urge the Minister and Government to consider this need for much stronger, transparent, and societally inclusive, national carbon budget governance at the earliest possible opportunity.**

⁴ See: O'Dochartaigh, Price, and McMullin (2022) *How to keep the Government honest on climate change: New framework will allow public to check if Ministers are meeting emissions targets.*
<https://www.irishtimes.com/opinion/how-to-keep-the-government-honest-on-climate-change-1.479011>

⁵ McMullin, B (2017) *How the State can make Ireland a Leader in Tackling Climate Change: TEQs: Empowering Citizens for Radical Climate Action*
<http://www.eeng.dcu.ie/~mcmullin/etc/Citizens-Assembly-Climate-Action-2017-08-11-BMcM/Citizens-Assembly-Climate-Action-2017-08-11-BMcM-Full.pdf>

<http://www.teqs.net/Reconciling%20scientific%20reality%20with%20realpolitik.pdf>

⁶ Chamberlin *et al.* (2015) *Reconciling scientific reality with realpolitik: moving beyond carbon pricing to TEQs – an integrated, economy-wide emissions cap*
<http://www.teqs.net/Reconciling%20scientific%20reality%20with%20realpolitik.pdf>

5. Nitrogen budgets and land use are critical in carbon budgeting

Reactive nitrogen usage (via fertiliser and feed) in agriculture and land use planning are critical to Paris-consistent carbon budget delivery because ongoing reductions in non-CO₂ emissions (CH₄ and N₂O) are required in addition to reaching zero net CO₂ emissions before 2050. Over 90% of Ireland's CH₄ and N₂O emissions are from agriculture, primarily from dairy and livestock (beef and sheep) production. Nitrogen (N) in fertiliser and feeds is the primary driver of these emissions: N usage had fallen to 298 ktN/yr by 2011 under the EU milk quota and extensification policies, but has now risen to 399 ktN/yr in 2021 largely due to the abandonment of these controls, entirely contrary to prudent climate and environmental policy objectives. By comparison the 2021 Climate Action Plan, under Action 304, only targets maximum chemical nitrogen usage of 350 ktN/yr by 2025 and 325 ktN by 2030, which is still higher in 2030 than in 2011.

Prioritisation of increased dairy and continued beef production has resulted in substantial rises in absolute CH₄ and N₂O emissions, increased ammonia emissions in excess of the national ceiling and rising nitrate concentrations in waterways and estuaries. EPA data shows no significant change in dairy or beef production GHG or N-efficiency, therefore increased production has resulted in more GHGs and pollution. Our research⁷ indicates that these trends are opposed to Paris consistent carbon budgeting, especially given the effect of agricultural methane increases⁸. Moreover, a substantial fraction of the tillage land on dairy and mixed farms has been converted to cattle pasture or related silage production, requiring increased imports of animal feed. Setting a course to reversing these trends is likely required to achieve a sustainable transition for agriculture. Therefore, a national land use plan is *urgently* needed to guide agriculture, forestry and land use for alignment with carbon budgets, food security, and environmental goals regarding air pollution, water quality and biodiversity.

- **Based on Teagasc Scenario E as produced for the Council's Technical Report, we recommend maximum national quotas of 325 ktN/yr by 2025 and 250 ktN/yr by 2030 for imported chemical nitrogen to align with climate targets.**
- A national land use planning assessment could assess the long-term resilience and coherence of alternative land use mixes within carbon budgeting and other policy objectives.

⁷ McMullin and Price (2020) *Synthesis of Literature and Preliminary Modelling Relevant to Society-wide Scenarios for Effective Climate Change Mitigation in Ireland* EPA Report 352 2016-CCRP-MS.36

<https://www.epa.ie/publications/research/climate-change/research-352-synthesis-of-literature-and-preliminary-modelling-relevant-to-society-wide-scenarios-for-effective-climate-change-mitigation-in-ireland.php>

⁸ Price and McMullin (2020) *Assessing methane (CH₄) from Irish agriculture in climate policy 2005–2020 using the GWP₁₀₀ and GWP* greenhouse gas (GHG) equivalence metrics*

<https://tinyurl.com/IE-Agri-CH4-GWPstar-GWP100>

6. Ireland's international diplomacy is crucial to climate action

The international dimension of Ireland's climate action is an essential policy element. 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.

- **We suggest that this Government now initiate an urgent collaborative activity between the Ministers and Departments responsible for *Environment and Climate Action, EU Affairs, and Foreign Affairs and Defence* to consider how Ireland can significantly upscale and prioritise the State'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.**