

**Comments on the publication of the draft Climate Action and Low Carbon Development  
(Amendment) Bill 2020**

**Submission to Oireachtas Joint Committee on Climate Action**

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The publication of the draft *Climate Action and Low Carbon Development (Amendment) Bill 2020* is greatly welcome. The Bill sets the “rules of the game” in place for Ireland to transition to a sustainable society, necessary for compliance with the 2015 Paris Agreement, and harnessing the many potential benefits of a sustainable energy transition. It will put Ireland among the handful of countries which have set such targets and pre-empts a likely requirement from the EU for the same.

I thank the Committee for the opportunity to offer the following recommendations and observations, which are based on my more than 10 years’ experience in sustainable energy systems analysis in Ireland, the UK and at the international level.

**1. A separate mandatory target for biogenic methane is strongly advised**

*The distinct warming characteristics of biogenic methane make it inappropriate to aggregate all greenhouse-gases into a single target; models used by the IPCC suggest that global methane from agriculture needs to fall by 24-47% by 2050 to limit global warming to 1.5C. Ireland should adopt a distinct target for methane based on this analysis.*

The purpose of setting carbon budgets is to give stable and credible signals on the trajectory of emissions mitigation. They also allow flexibility in mitigation efforts across sectors as technologies and demands evolve. The current formulation of the Bill creates significant uncertainty and therefore fails in this purpose, specifically for emissions of methane from the agriculture sector.

There is uncertainty as to which greenhouse gases (GHGs) are to be included in carbon budgets: 2(a) “carbon budget’ means, in relation to one or more greenhouse gases, the total amount of greenhouse gas emissions that are permitted during the budget period;” This ambiguity is a shortcoming. If carbon budgets are to contain CO<sub>2</sub> alone within this definition, then other GHGs including biogenic methane, a potent GHG, will not be covered. The wording of much of the rest of the Bill implies that methane

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from agriculture is to be included in carbon budgets using standard accounting frameworks. I argue against methane being included in carbon budgets, and for a separate and distinct long-term target for methane to be included in the Bill for the following reasons.

The Bill gives special treatment to agriculture and methane. It uses wording which allows for “*the distinct characteristics of biogenic methane*” and “*the special economic and social role of agriculture*”, also referring to carbon leakage, and therefore gives the impression that decarbonisation ranges (sector-specific targets) can be set with less ambition for agriculture.

This implies that the energy system would need to decarbonise faster to compensate. For example, the Programme for Government aims for a halving of aggregated GHGs by 2030. If emissions from methane only declined at the rate envisaged in the Climate Action Plan, then energy emissions would need to fall by around two-thirds so that the overall target is reached, which is likely impossible. The uncertainty fails to give a reliable signal to the agriculture sector.

Aggregating both gases into a single target is inconsistent with the following text in the Bill: 3.3(y) “*the Government shall have regard to ... the distinct characteristics of biogenic methane referred to in the Special Report on Global Warming published by the Intergovernmental Panel on Climate Change on 8 October 2018*”. The current GHG accounting framework does not achieve this.

**The GWP\* metric, which does account for methane’s distinct characteristics (strong potency as a warming gas but short life), find that that between 2012 and 2018, when emissions were rising, methane from agriculture accounted for 35% of Ireland’s global warming impact** – this is eleven percentage points more than when measured using the current accounting metric<sup>2</sup>. This refutes assertions that the GWP\* metric implies that “the warming impact from Irish livestock is vastly overestimated”<sup>3</sup>.

Furthermore, Section 2(a) of the Bill states that the definition of a ‘climate neutral economy’ means “*a sustainable economy, where greenhouse gas emissions are balanced or exceeded by the removal of greenhouse gases;*”. This definition is valid for CO<sub>2</sub>, whose warming impact will continue to grow until emissions are balanced by removals (i.e., they reach net-zero). However, methane has a shorter lifetime in the atmosphere, therefore additional warming from this source ceases when its emissions begin to fall slightly, not when they reach zero.

However, these are not arguments for setting an unambitious target for methane. **All evidence points to agriculture contributing a very significant share of Ireland’s global warming impact**, particularly when agriculture production is growing<sup>4</sup>.

Furthermore, **global methane from agriculture needs to reduce by one-quarter to one-half to meet the 1.5C temperature target**. Global climate-energy-land use models which inform the IPCC’s assessment of mitigation pathways for the 1.5C temperature target indicate that CO<sub>2</sub> emissions need to fall to net-zero by around 2050, with strong early action, with CO<sub>2</sub> emissions halving by 2030. However, the same pathways require strong but less rapid reductions from methane emissions from agriculture – a fall of 11 to 30% by 2030 and 24 to 47% by 2050, relative to 2010 (Figure 1).

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<sup>2</sup> A new technical working paper has been provided alongside this document to present this analysis.

<sup>3</sup> <https://www.farmersjournal.ie/warming-impact-of-methane-emissions-from-irish-livestock-vastly-overestimated-576649>

<sup>4</sup> Note that my comments are limited to the warming of CO<sub>2</sub> and methane. In addition, the role of Nitrous Oxide (N<sub>2</sub>O) should be taken into account.

Insights from these models imply that the 2019 Climate Action Plan target for agriculture emissions is likely appropriate, but a longer-term 2050 target, which is consistent with the Paris Agreement temperature limit, is also necessary to send a strong and credible signal to the sector.

**Therefore, I strongly argue that the Bill should include a distinct and clear mandatory long-term target for biogenic methane,** consistent with IPCC models, along with a net-zero target for CO<sub>2</sub>. This has been done in New Zealand where methane accounts for 43% of GHGs for the reasons I outlined above. This has also been advocated by the Advisory Council.

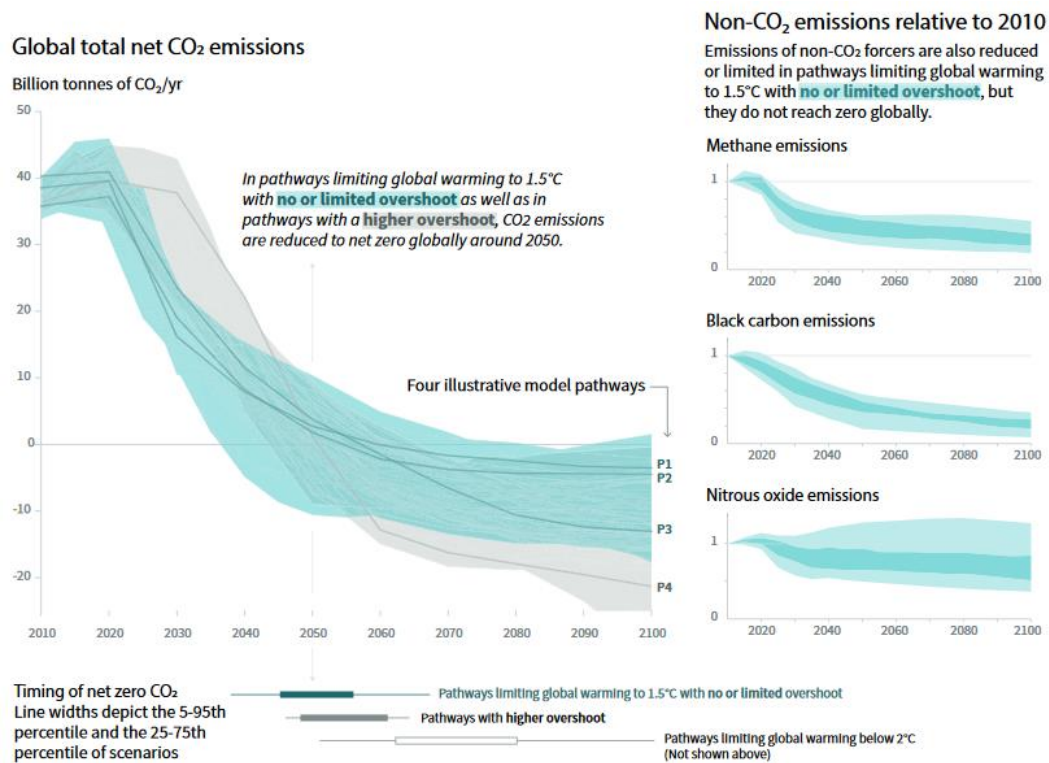


Figure 1 - Global emissions pathway characteristics limiting global warming to 1.5°C. Global scenarios meeting the temperature target with "no or limited overshoot" show that agriculture methane emissions decline by 11-30% (interquartile range of model scenarios) by 2030 relative to 2010, and 24-47% in 2050. This compares with an interquartile range of CO<sub>2</sub> emissions reductions of 40-58% in 2030 and 94-107% in 2050, relative to 2010. Source: Figure SPM.3a (IPCC, 2018)

Ireland should also **advocate for binding and distinct methane targets at the EU level** or alternatively, seek that the effort-sharing decision is made taking into account the distinct warming characteristics of methane. A more ambitious target for 2030 is currently being negotiated, for likely adoption in early 2021. Ireland has by far the highest share of methane from agriculture in its emissions inventory in the EU (Figure 2). If the EU sets effort-sharing targets based on the existing accounting framework, without consideration for the distinct characteristics of biogenic methane, this could create an inconsistency with Irish climate policy.

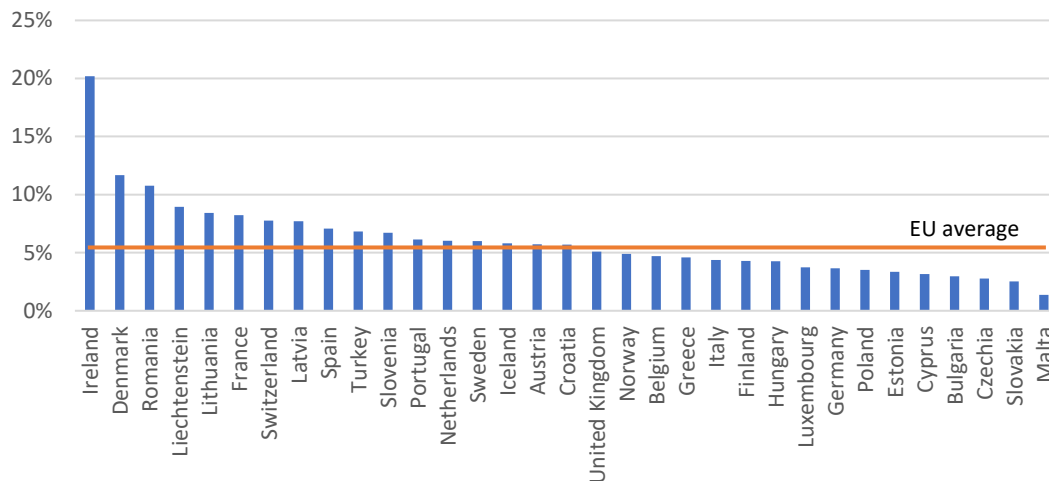


Figure 2: Share of methane in GHG accounts in EU countries, 2018. Data source: European Environment Agency (EEA)

On the question of carbon leakage, **I challenge the rationale for including the following provision:** “the risk of substantial and unreasonable carbon leakage as a consequence of measures implemented by the State to pursue the national 2050 climate objective;” 3(3)(p). It is frequently asserted that Ireland’s agriculture has a low carbon footprint, to justify continued growth in production. A review by the Advisory Council in 2019 showed that evidence for this is mixed, with some studies suggesting Irish agriculture has an average to high carbon footprint compared with other EU countries<sup>5</sup>. It also concludes that “there is insufficient evidence to provide a definitive answer to whether a reduction in agricultural production in Ireland will lead to a net increase in global greenhouse gas emissions.” Furthermore, EU GHG targets are based on territorial emissions, therefore using this provision in Ireland would lead to an inconsistency.

## 2. A principle for setting intermediate targets is needed for consistency with Article 2 of the Paris Agreement

The Bill defines an emissions target for 2050, which aligns with the so-called “climate neutral goal” of Article 4 in the Paris Agreement<sup>6</sup>. However, the purpose of this goal is to enable the achievement of Article 2 (temperature rise limit).

Ireland’s impact on global warming is driven by total cumulative CO<sub>2</sub> emissions, rather than emissions in a given year in the future (Figure 3). An “effort sharing methodology” which allocates the global estimated carbon budget consistent with Article 2 on a global per-capita basis suggests that the trajectory of mitigation in Ireland should be rapid (the “Early action” trajectory in Figure 3) (evidence to this effect has already been presented to the Committee by my colleague, Dr James Glynn).

The Bill fails to define the process by which the Advisory Council should set the carbon budgets to achieve the 2050 target. **Therefore, I propose that Bill be amended in Section 6.6 such that the**

<sup>5</sup> Emmet-Booth, Dekker & O'Brien (2019) *Climate Change Mitigation and the Irish Agriculture and Land Use Sector* Climate Change Advisory Council Working Paper No. 5 pages 16-20

<sup>6</sup> “In order to achieve the long-term temperature goal set out in Article 2, Parties aim 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...”

## Advisory Council should set carbon budgets having regard to both Articles 2 and 4 of the Paris Agreement.

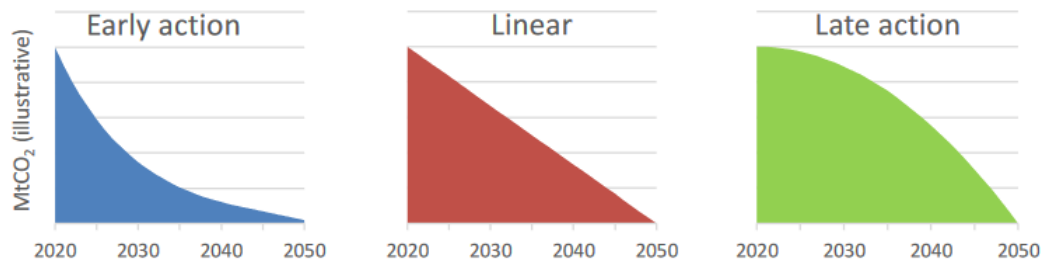


Figure 3 Illustrative decarbonisation trajectories to 2050: each pathway above reaches the same 2050 goal of net-zero CO<sub>2</sub> emissions, but in the Late Action pathway, cumulative emissions are double that of the Early Action pathway, leading to double the warming impact (McGuire et al., 2020)<sup>7</sup>.

### 3. Scrutiny of climate policy analytical capacity is needed

The comments in this section are not intended to influence the content of the legislation, and are based on my familiarity with the analytical process of underpinning carbon budgets, sectoral carbon ranges, and policies in the Climate Action Plan to meet sectoral decarbonisation targets.

International best practice suggests that setting carbon budgets and Climate Action Plans requires a sound evidence base that is i) transparent, ii) based on a wide range of modelling tools, and iii) consulted widely with stakeholders and interdisciplinary experts. This is to ensure societal buy-in, and that sub-optimal policies are not adopted which would either lead to unintended consequences or miss potential co-benefits of the sustainable energy transition.

Analysis behind the 2019 Climate Action Plan relied primarily on a proprietary Marginal Abatement Cost (MAC) Curve, details of which (to my knowledge) have not been published or peer reviewed. I argue that using a MAC Curve alone is not appropriate for long-term climate abatement analysis as it does not capture complex energy system interactions, uncertainty, sensitivity or path-dependency<sup>8</sup>. Additionally, the evidence base for climate policy should be as transparent as possible<sup>9</sup>.

Furthermore, I suggest that the Committee review the analytical expertise and capacity of the relevant Departments and Advisory Council to understand whether they are appropriately and sufficiently resourced to develop the evidence base behind sectoral carbon targets and mitigation policies. Deep institutional expertise and capacity is needed. I suggest that benchmarking against similar countries, like Denmark and New Zealand, in this regard is advisable.

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<sup>7</sup> Mc Guire, J., Rogan, F., Daly, H., Glynn, J., & Ó Gallachóir, B.. (2020). The role of carbon budgets in translating the Paris Agreement into national climate policy - Discussion Paper. Retrieved from [https://www.marei.ie/wp-content/uploads/2020/10/Discussion-Paper\\_The-role-of-carbon-budgets-in-translating-the-Paris-Agreement-into-national-climate-policy.pdf](https://www.marei.ie/wp-content/uploads/2020/10/Discussion-Paper_The-role-of-carbon-budgets-in-translating-the-Paris-Agreement-into-national-climate-policy.pdf)

<sup>8</sup> Kesicki & Ekins (2011) *Marginal abatement cost curves: a call for caution*. Climate Policy, Pages 219-236. <https://doi.org/10.1080/14693062.2011.582347>;

Kesicki, F., & Strachan, N. (2011). Marginal abatement cost (MAC) curves: Confronting theory and practice. *Environmental Science and Policy*, 14(8), 1195–1204. <https://doi.org/10.1016/j.envsci.2011.08.004>

<sup>9</sup> Strachan, N., Fais, B., & Daly, H. (2016). Reinventing the energy modelling-policy interface. *Nature Energy*, 1, 16012.

DeCarolis, J., Daly, H., Dodds, P., ... others. (2017). Formalizing best practice for energy system optimization modelling. *Applied Energy*, 194, 184–198.

#### 4. Other considerations

- a) I believe that the overly-narrow term “climate neutral economy” should be replaced by “climate neutral society” or “climate neutral state” to be inclusive of the fundamental social institutions which are required to play a part in the sustainability transition, and which stand to benefit<sup>10</sup>. Ireland is far more than the sum of its economic transactions and the market alone cannot become sustainable, outside of strong governance and societal buy-in.
- b) The Committee should consider the rationale for starting the first budget period on January 1<sup>st</sup> 2021, less than two months away at the time of writing.
- c) I share the concerns that others have expressed about the limited accountability of the Government in case carbon budgets are exceeded.
- d) The Committee is aware that this legislation and target-setting is a necessary step to create a system of accountability, but insufficient to actually achieve mitigation. The great challenge of ending unmitigated fossil fuel burning in 30 years will only be met with strong policy and political leadership, as well as societal buy-in, and policies are currently far from being in place to actually reduce emissions – the EPA’s projections of emissions under existing policies indicate a continuing rise in emissions, an untenable future.

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<sup>10</sup> Speech by President Michael D. Higgins - “Confronting Planetary Emergencies” OECD Conference, 9th October 2020. Retrieved from [https://www.oecd.org/naec/confronting-planetary-emergencies/OECD\\_Speech\\_President\\_Michael\\_D\\_Higgins.pdf](https://www.oecd.org/naec/confronting-planetary-emergencies/OECD_Speech_President_Michael_D_Higgins.pdf)