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Pre-Legislative Scrutiny of the Climate Action and Low Carbon
Development (Amendment) Bill 2020:

Carbon capture and offsetting in reaching carbon neutrality

Opening Statement | 29th October 2020

Dr James Glynn – Research Fellow

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OPENING

- *Thank you chair, and thank you to members of the committee for the invitation to speak here today and provide evidence upon the climate action and low carbon development bill in relation to the role of carbon capture and offsetting in reaching carbon neutrality.*
- *I am an energy system engineer and research fellow at the SFI MaREI Centre for Energy Climate and Marine. I focus on energy systems analysis and recently with my team we have published research on national and global bases on the role of carbon capture and storage in zero carbon energy systems consistent with the Paris Agreement.*
- *I want to highlight the following key points from 4 of our published research articles, 2 technical reports and 1 discussion document, in my evidence this afternoon which are included as an appendix in my statement submitted to the committee.*

KEY POINTS

- 1) Achieving climate neutrality globally in 2050 means that 2050 is the year temperatures stop increasing. Further, and more importantly, the cumulative greenhouse gas (GHG) emissions before reaching climate neutrality in 2050 dictates the temperature we stop at.
- 2) MaREI analysis shows that equitable carbon budgets for Ireland based on the Brazilian rule to be compliant with the Paris Agreement range from 638MtCO₂ to 225MtCO₂ from the year 2020 until a point in time when energy system carbon dioxide (CO₂) emissions are reduced to net-zero and temperature increase is stabilised at 2°C or 1.5°C.
- 3) MaREI analysis - applying these carbon budgets to the Irish Energy system - shows that Irish CO₂ emissions need to decrease by between 4%-9% per year from 2020-2030 to play our equitable part of keeping global temperature increase below 2°C, and to reduce between 11%-21% per year from 2020-2030 to keep global temperatures below 1.5°C without overshooting that temperature ceiling.
- 4) The majority of the scenarios that the 7% reduction rate in the programme for government is based upon, assume that the global temperature increase overshoots 1.5°C during this century and returns below 1.5°C by 2100.
- 5) In the Irish least-cost mitigation scenarios I modelled (Glynn et al., 2019), the scenarios without carbon dioxide removal (CDR) technologies require immediate decarbonisation at rates approximately double the rate to scenarios without CDR. 7% to 21% reduction rates in CO₂ emissions per year are required as well as larger energy service demand reductions with impacts on public welfare.
- 6) In our analysis typically carbon capture and storage (CCS) technologies are deployed early in gas electricity generation, as well as for process emissions capture for cement production, and in some cases with Bioenergy CCS (BECCS) to provide negative emissions electricity which offsets emissions from other hard to mitigate sectors.
- 7) In scenarios without bioenergy imports, typically we need earlier and more CO₂ capture.
- 8) Residual fossil fuel emissions from CCS technologies can become inconsistent with scenarios with stringent net-zero emissions targets. This means that fossil-fuel CCS plants without near 100% capture rates of CO₂ are likely inconsistent with Paris Agreement compliant targets without emissions offsetting elsewhere in the energy system.

- 9) Further MaREI analyses with global integrated assessment models (IAMS) also demonstrate a considerable reliance on CDR technologies to achieve the Paris Agreement goals and highlight the considerable cost increases in achieving the Paris Agreement goals without CCS or direct air carbon capture and storage (DACCS) CDR technologies.
- 10) Globally the development of CCS, DACCS and CDR technologies are already far behind the technology readiness levels needed to meet the Paris Agreement goals as per the IPCC/IAMC, IEA and industry scenario analysis.
- 11) I would also like to draw your attention to the EU CCS directive and amendments and the Irish ministerial decision that Ireland has exercised its right, in accordance with Article 4 of the directive, not to allow for any storage (of CO₂) in part or in the whole of the State and therefore there is currently no area of Irish territory that would be free to be used for CO₂ storage. However, this issue will be kept under active review¹.

Recommendations

I welcome this bill, particularly the attention paid to define and implement carbon budgets; there is however still room for improvements.

- 12) I note that previous debates with evidence from legal experts highlight the ambiguity in some of the language from a legal perspective. I repeat this concern and also add that from a scientific and engineering perspective, the ambiguity in some of the language of the bill also means that one cannot measure or define whether or not commitments within the bill are being met. I recommend scientifically explicit language to be used within the bill, with particular attention paid to definitions of;
 - a) carbon budgets,
 - b) the gases to be included in said carbon budgets,
 - c) the method used to calculate warming of each GHG as a proportion of the carbon budget,
 - d) which gases, if any, will **not** be included in the carbon budgets,
 - e) the timeline of the carbon budget,
 - f) the definition of “removal” to include removal of GHGs in energy combustion and industrial processes **prior** to release to the atmosphere,
 - g) include the Irish territorial waters in the definition of “sink”,
 - h) define “climate resilient”,
 - i) define “climate neutral” – (consider a definition of net-zero increase in radiative forcing - being cognisant of differences between short lived and long lived GHGs)

¹The EU CCS directive & Amendments are available here:

https://ec.europa.eu/clima/policies/innovation-fund/ccs/implementation_en

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0031>

<http://www.irishstatutebook.ie/eli/ResultsTitle.html?q=Storage+of+Carbon+Dioxide>

S.I. No. 575/2011 - European Communities (Geological Storage of Carbon Dioxide) Regulations 2011.

S.I. No. 279/2014 - European Communities (Geological Storage of Carbon Dioxide) (Amendment) Regulations 2014.

j) define “decarbonisation range” – (per tonnes of each GHG per NACE category per year)

Some recommendations I think are worth consideration in the amended bill:

- 13) Reinststate the *pursuit **and achievement*** of a minimum acceptable goal to be included for objective measurement of targets in the bill. This is in line with the language of the Paris Agreement which pursues a 1.5°C target but the ultimate objective of the UNFCCC is to **hold** the post-industrial temperature increase well below a 2°C target.
- 14) Consider a binding carbon budget for the period from 2020 until climate neutrality (2050) is achieved.
- 15) Investigate whether an overarching carbon budget should be included in the long-term climate action strategy time-horizon of analysis bounded by the projected expected year of temperature stabilisation (30-50 years). Long-term information significantly impacts upon short-term policy actions. Myopia is extremely costly in long-term energy systems planning.
- 16) Explore whether sectoral carbon budgets could be allocated based on carbon intensity per value added per NACE category sector.
- 17) Acknowledge the role of early dialogue and societal buy in. Behaviour change and demand reduction will be required. The national objective is unlikely to be met by technological means alone.
- 18) Implement the Paris Agreement ratchet mechanism such that, 5 year carbon budgets should not be larger than the previous 5-year cumulative emissions.
- 19) The bill should consider Ireland’s offsetting and trade mechanisms as well as multi-lateral responsibilities to developing nation’s ability to decarbonise and to consider the impact of international aid into account on offsetting within Irish carbon budgets.

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Supporting Evidence (References)

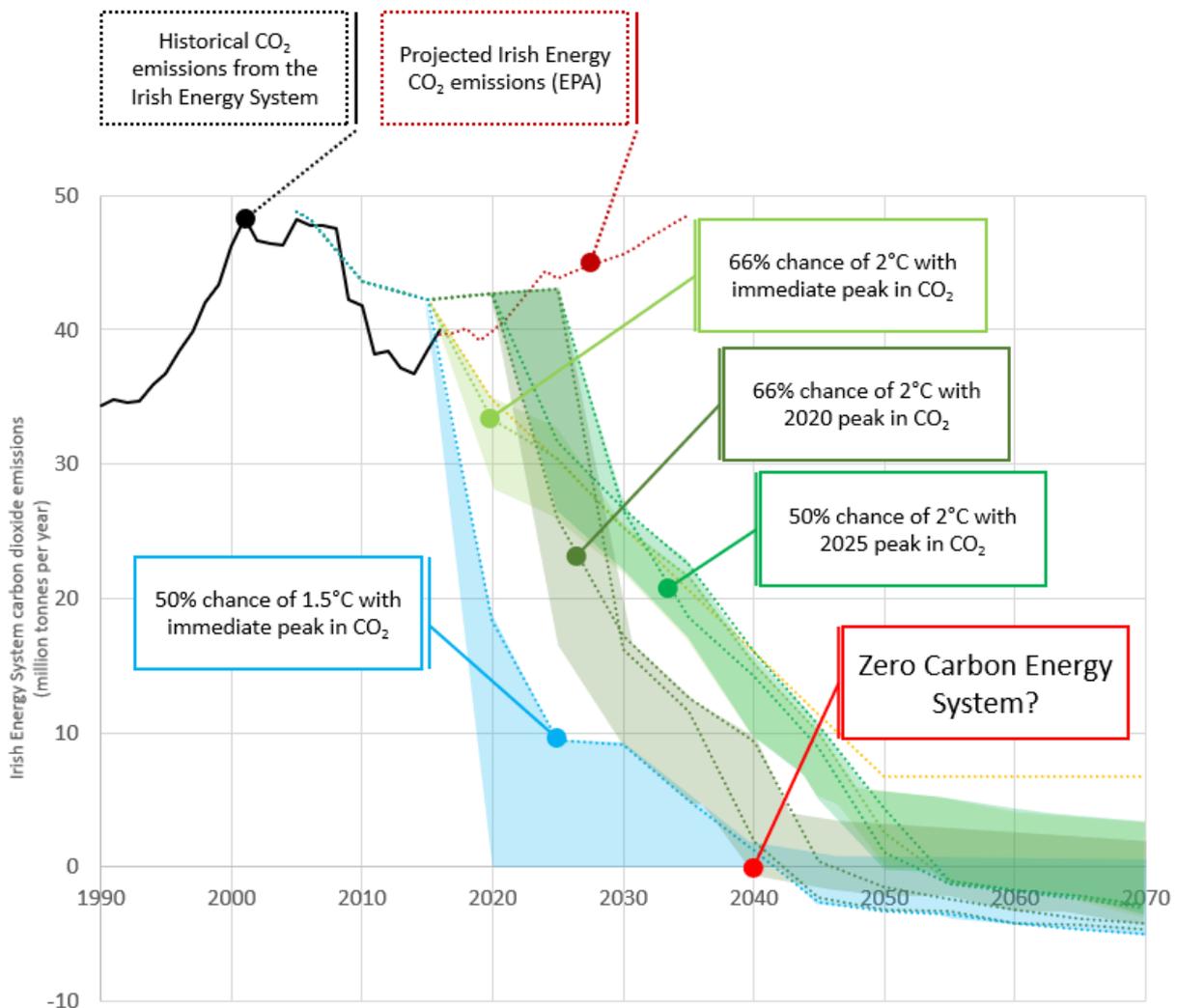


Figure 0-1 Irish Decarbonisation Pathways consistent with the Paris Agreement:(Glynn et al., 2019)

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