An Taisce
The National Trust for Ireland

23.03.15

climatechange@agriculture.gov.ie

Re: Public Consultation on the discussion document on GHG mitigation in the Agriculture and Forestry sector

Dear Sir/Madam,

An Taisce welcomes the publication of a discussion document on the potential for Greenhouse Gas (GHG) mitigation within the Agriculture and Forestry sector and would like to make the following comments which we request the Department take into consideration in its contribution to the national mitigation plan.

It is also requested that the Department make known to An Taisce any further consultation planned regarding the making of this policy and issue An Taisce with notification of any proposed amendments.

Yours sincerely,

Eoin Heaney

Programmes and Administration Officer
eoin.heaney@antaisce.org

An Taisce's Response to Discussion Document on GHG Mitigation within Agriculture and Forestry Sector

Join Us

An Taisce, the National Trust for Ireland, is a membership-based charitable organisation committed to enhancing our quality of life, heritage and environment.

www.antaisce.org/membership

Glossary

AFOLU - Agriculture, Forestry and Other Land Use

DAFM - Department of Agriculture, Food and the Marine

EPA - Environmental Protection Agency

ETS - Emissions Trading Scheme

FAPRI - Food and Agricultural Policy Research Institute

FH2020 - Food Harvest 2020

Gt. - Gigatonne (One billion tonnes)

GHG - Greenhouse Gases

- CO_2 (Carbon Dioxide)
- N_2O (Nitrous Oxide)
- CH_4 (Methane)

GTP - Global Temperature Change Potential

GWP -Global Warming Potential

IPCC - Intergovernmental Panel on Climate Change

- AR5 (Fifth Assessment Report, 2013)
- AR4 (Fourth Assessment Report, 2007)
- WG (Working Group 1,2,3 etc.)

LCA - Life Cycle Analysis

MACC - Marginal Abatement Cost Curve for Irish Agriculture[1]

MAP - Mitigation Action Plan

Mt.CO2eq. - Megatonnes of Carbon Dioxide Equivalent

NESC - National Economic and Social Council

UNEP - United Nations Environmental Programme

UNFCCC - United Nations Framework Convention on Climate Change

[1] MACC quantifies the current opportunities for abatement of agricultural greenhouse gases, as well as the associated costs/benefits, and may be of use for guidance in the development of policies aimed at reducing greenhouse gas emissions from the non-ETS sectors. (Teagasc website)

Contents

1.0 Executive Summary

2.0 Direct Responses to Headings in the Discussion Document

3.0 Feedback Points on Document's Methodology

4.0 Feedback Points on an Agri Mitigation Action Plan

5.0 Proposed Revised Mitigation Action Plan for Agriculture

6.0 Contextual Considerations not Present in the Discussion Document

6.1 Carbon Sequestration and Joined Up Thinking

6.2 The Flawed Interpretation of 'Sustainability'

7.0 Conclusion

1.0 Executive Summary

An Taisce's principal concern is that any plan for GHG mitigation by the agricultural sector must actually and measurably contribute to the necessary, immediate, substantial and sustained reductions needed in Ireland's total emissions. In the discussion document, **cutting total emissions does not feature** among the four key objectives mentioned. A sectoral plan must contribute emission cuts to the national plan, or, if not, explain why it is not and how it will pay for compensatory cuts in other sectors.

Agriculture needs to contribute emission savings immediately to help cut Ireland's annual total emissions. Currently Ireland is failing even to meet the Environmental Protection Agency's (EPA) 'With Measures' scenario, a "worst case". At present, the 20% target reduction relative to 2005 to which Ireland has committed in accordance with EU requirements may be as low as 2% in reality according to EPA projections[2]. Agriculture had decreased annual emissions by 1.2 MtCO2eq (-9%) from 2005 to 2011, but now the EPA project emissions to increase by 2.3 MtCO2eq (+12%) by 2020[3]. Given the strong requirement to cut national emissions, An Taisce urge DAFM to make absolute emission cuts a key focus of the 'Agriculture Sector Mitigation Action Plan'.

Achieving real cuts in emissions and increases in sequestration will require significantly greater drivers than applied to date. Therefore **imposing a cost on the methane and nitrous oxide climate pollution from agriculture seems an obvious and necessary measure.** Currently, climate pollution costs are not included in DAFM mitigation costings even though the Teagasc's MACC study[4] depends on a carbon cost and science estimates very high global health and damage climate costs for agricultural sector greenhouse gases. The recent EU Commission draft Country Report[5] clearly signalled that integrated climate action demands a consistent price on climate pollutants i.e. a price on carbon extending to agricultural emissions. Revenues raised from polluters should be ring-fenced and provided to farmers and others that avoid emissions and sequester carbon. This would enable much faster progress to low-carbon targets and avoid 2020 compliance costs.

The discussion document does state sustainability aims. However, producing extra livestock-derived food to feed a growing global population of wealthier consumers will not respect the environmental limits of the planet or feed the poorest[6]. Climate projections are clear that global emissions from livestock agriculture, like fossil fuel extraction, will likely have to be limited to achieve re-stabilisation of the Earth's climate system. **Knowingly contributing to increasing Ireland's responsibility for climate risk and damage, as current FH2020 and 2025 policy do, is not a 'climate smart' response.**

An ill-defined "approach to carbon neutrality" as a "horizon point" for agriculture[7] is insufficient to meeting these realities. The horizon, by definition, is always retreating. An Taisce urge DAFM and the agricultural sector to plan for and achieve near-term and continuing absolute emission cuts to play a real part in GHG mitigation.

---

[2] EPA (2014) Ireland's Greenhouse Gas Emission Projections 2013-2030 pp.2-3
[3] EPA **IRELAND'S PROVISIONAL GREENHOUSE GAS EMISSIONS IN 2013 p.9**
[4] Teagasc (2012) **A Marginal Abatement Cost Curve for Irish Agriculture p.29**
[5] EUROPEAN COMMISSION STAFF WORKING DOCUMENT p.58
[6] UNEP Assessing the environmental impacts of consumption and production p.82
[7] DAFM discussion document p.57-58

2.0 Direct Responses to Headings in the Discussion Document

Foreword

The following statements appear in the forward of the discussion document:

> "The challenge facing our sector is immense because we have to produce extra food to feed a growing global population while respecting the environmental limits of the planet."
>
> "We intend to do much more and with our natural advantages, and the quality of our agricultural research, we should seek to be the global leader in sustainable food production."

DAFM risk misleading the public with these statements. Producing extra livestock-derived food to feed a growing global population of wealthier consumers does not respect the environmental limits of the planet or help in equitable access to food by the poorest. The discussion document has an implicit premise that producing more food for the global community necessarily means more livestock-based agriculture and that this justifies increased emissions. An Taisce disputes and challenges this central assumption and there is a considerable body of research supporting such a challenge including studies by IPCC WG3[8], UNEP[9], and Teagasc[10].

It is clear from climate modelling[11] that global emissions from livestock agriculture, like fossil fuel extraction, will have to be limited to achieve re-stabilisation of the Earth's climate system. The projected growth in global consumption of livestock products by wealthier consumers and the resultant emissions are simply unsustainable and will have to be constrained over time; feeding that demand, particularly with beef and dairy exports, will be adding to the pressures on environmental limits.[12]

> "Sustainably increasing agricultural productivity and incomes"

'Sustainably' here appears to refer to 'short-term profitability rather than the correct meaning: "development which meets the needs of the present without compromising the ability of future generations to meet their own needs." It is important to remember that the Earth's climate system does not 'care' about sustaining "agricultural productivity and incomes", it will simply respond to the GHGs humanity adds and the resulting trapping of solar energy. Only by

[8] IPCC WG3 Ch 11 p.4
[9] UNEP (2010) Assessing the environmental impacts of consumption and production *Priority Products and Materials*
http://www.greeningtheblue.org/sites/default/files/Assessing%20the%20environmental%20impacts%20of%20consumption%20and%20production.pdf
[10] Donnellan et al (2014) Some difficult choices for policy makers. http://link.springer.com/chapter/10.1007%2F978-3-319-06635-6_13
[11] DECC (2014) The Global Calculator. See 'Diet', meat quantity and type. http://tool.globalcalculator.org
[12] FAO Module 8: Climate Smart Livestock pp 218-219 http://www.fao.org/3/a-i3325e/i3325e08.pdf

rapidly decreasing GHG emissions can the climate system be stabilised to ensure sustainability of global food production. Wealthy countries maintaining or increasing livestock CH_4 and N_2O emissions are knowingly, *decreasing* the sustainability of future global productivity and incomes.

> "Reducing and/or removing greenhouse gases emissions, where possible."

What do DAFM mean by "where possible"? DAFM need to make clear whether they mean politically or economically 'possible' as opposed to what is ecologically essential for global sustainability. A fully considered climate mitigation action plan demands that the civil service examines the necessity of mitigating total annual emissions even if the logical option, cutting livestock numbers is thought to be politically difficult or economically challenging. Climate action requires rethinking what is 'possible'.

Introduction

"We still don't know the details of how these changes will affect Ireland, but we know that we need to act responsibly and prepare for the future."

It is not enough to think about climate effects on Ireland, which may or may not be large in the medium term. It is much more important to also think about the global impacts that continuing high levels of livestock emissions are adding to. The most likely early impacts of climate change for Ireland are *not* local climate effects, they are higher imported food costs (most of Ireland's food is imported) and resulting diminished international security. Real reductions in emissions are critical to reducing these climate risks.

Figure 1.1 Adaptation and mitigation defined.
The mitigation definition is incomplete; the word 'atmosphere' is omitted.

Given the limited remaining global carbon budget it is the view of An Taisce supported by many prominent climate scientists' that without undertaking urgent, rapid, substantial and sustained mitigation (especially in richer nations) to limit warming, limits of future adaptation may be breached. DAFM could consider stating this reality and placing the definition before adaptation.

Figure 1.3 Irish agriculture GHG emissions vs total cattle numbers 1990-2012

We note that the cattle numbers have now been corrected from previous DAFM presentations of this chart (see discussion document, Teagasc figure on p.60) to increase by about a million cattle in each year to match EPA numbers, a correction recently pointed out by An Taisce.

> "The increase in agriculture emissions in 2012 represents the first significant increase over the 13 year period since 1999. This increase is underpinned by increasing animal numbers with dairy cows 2.3% higher in 2012 compared to 2011. This reflects national plans to expand milk production under Food Harvest 2020 and following removal of milk quota in 2014." (Page 9)

This omits to mention that due to expansion of livestock numbers under FH2020, the EPA

forecasts a 12%, 2.3 MtCO2eq rise in emissions from 2011 to 2020, more than taking back all progress in cutting emissions since 2005. Agriculture and transport are failing to help Ireland meet its 2020 targets.

Background context

Consideration of Metrics

> "Methane (CH_4) (has a global warming potential of 21 times that of CO_2 over a 100 year time horizon)"
> "Nitrous Oxide (N_2O) (has a global warming potential of 310 times that of CO_2) over a 100 year time horizon" Page 11

Both of these statements are incorrect, as they use outdated IPCC Second Assessment Report data. For the revised UNFCCC accounting that will be in use from now on the AR4 values for GWP-100year of 25 for methane and 298 for nitrous oxide will be used (these values are in Table 2.2 of the document).

It would also be useful for DAFM to note that IPCC AR5 now gives an updated scientific value for methane of 28, or 34 if including climate feedbacks[13]. While UNFCCC-related policy may be based on agreed accounting, evidence-based policy would be wise to take the latest AR5 figures into account as they represent the latest scientific understanding.

> "Since then, additional analysis has emerged on various metrics. The IPCC AR5 WG1 report presents findings from the analysis of these, including specific values for the most well developed, Global Temperature Potential, GTP, see Table 2.2." Page 11.

From this point until the end of section 2.2, the discussion is questionable, especially in presenting only a partial view of the science, in danger of being misleading.

> "Two specific aspects of the assessment are of note.
> - The GTP over 100 years for methane is 5-7 times less than that the GWP 100 years values
> - The IPCC have reported on analysis which differentiates between methane emissions from biogenic sources and those from fossil fuel (FF) and related industrial sources. The difference is marginal in the case of GWPs (biogenic 28, FF 30). However the difference is relatively larger for GTP (biogenic 4, FF 6)." Page 12.

Comparing GTP and GWP (two different metrics for comparing other greenhouse gases to the warming effect of CO_2) in terms of multiples is meaningless, like apples and oranges they are different things.

Not mentioned in either point is the fact that methane is short-lived in the atmosphere with a lifetime of only about 12 years. Therefore, using any 100 year metric can be considered misleading, whether GTP, GWP or any other. As DAFM are discussing metrics on the basis of

[13] IPCC AR5 WG1 Ch8 **Anthropogenic and Natural Radiative Forcing p.731**

the IPCC science then it would be appropriate to use a 20 year time horizon for methane.

For this 20-year time horizon, the IPCC gives GWP figures of 84 and 85 (non-fossil and fossil) and GTP figures of 67 and 68 (non-fossil and fossil) – almost no difference at all between fossil and non-fossil. These are far higher values than DAFM give and are more relevant to the actual warming produced by ongoing livestock emissions.

The key reference for the IPCC discussion of methane GTP[14] states:

> "The GTP is more sensitive to the inclusion of the CO_2 effect than the GWP because it is a fundamentally different metric. The GWP is a time-integral of the forcing and so retains the memory of the strong, relatively short-lived, direct methane forcing even for long time horizons. The GTP, by contrast, calculates the temperature at a given time after an emission; hence for time horizons long compared to the lifetime of methane, the direct impact of methane on temperature is largely forgotten, while the effects of the much more persistent CO_2 forcing on temperature remain."[15] [16]

Some stakeholders may prefer a metric and a time horizon for which "the direct impact of methane on temperature is largely forgotten" but it could be considered a biased viewpoint for a discussion document for public policy. It is useful to discuss the science for warming due to methane but the appropriate time horizon is 10 to 20 years.

Decreasing, rather than just flat-lining (or worse, increasing) ongoing emissions of methane and nitrous oxide is critical to action to achieve mitigation of global warming.

3. Mitigation and the Agriculture Sector

4. The Forestry Sector

Our Sections 3.0 and 4.0 below address these two sections of the discussion document with respect to policies, drivers, methodology and the proposed Agriculture Section Mitigation Action Plan.

5. Challenges to 2050

5.1 The challenge to 2050

> "To move Ireland towards becoming a carbon-neutral society, the NESC Secretariat proposes a pragmatic three-track approach". P.57

An Taisce's opinion is that the NESC Secretariat's "pragmatic approach involving simultaneous action along three tracks" is deeply unhelpful to mitigation action because it evades the difficult reality that absolute emissions must be cut in Ireland starting immediately. We note

[14] (Boucher et al, 2009)
[15] (Shine et al 2007)
[16] (Boucher et al, p.4)

that this approach was suggested by the NESC Secretariat, not as DAFM imply, by the full National Economic and Social Council (NESC).

The NESC Secretariat report was entirely wrong in framing recommendations as "From How Much to How To". The reverse is the case: defining how much emissions have to be cut by (the top-down target defining 'how much') is critical to driving 'how to' proceed with levels of carbon pricing and regulation needed that can drive effective and rapid actual mitigation of total emissions. The Secretariat's avoidance of this difficult reality in its report is an unhelpful and retrograde step in Irish climate policy.

> "Ireland needs to, and can, become a world leader in the production, management and marketing of low-carbon, high-quality sustainable food". p.57

By definition, moving to low-carbon sustainable food will require a transition away from high-carbon, less sustainable, livestock-derived food, especially beef production. A planned transition within an evidence-based Mitigation Action Plan in consultation with all stakeholders would avoid the surprise of a need for large and sudden reductions.

5.2 The Emissions Gap

> In the period to 2020, even with the adoption of technically feasible mitigation options for the agricultural sector, as suggested in the Teagasc MACC, and with appropriate supports under the proposed RDP, emissions are likely to flatline at best. p.57

"Flatlining", keeping emissions at current levels is not mitigation. Flatlining or increasing livestock emissions to 2020 will add to the compliance bill for missing Ireland's targets, which DAFM say that "will come at a cost to the Irish Exchequer". We would ask DAFM to explore the option of ensuring that the polluter pays rather than the general taxpayer.

> "This is not to say Irish agriculture is being complacent - in fact significant progress has been made in achieving efficiency improvements and the emissions intensity per calorie of food output in 2013 is reduced by approximately 14% relative to 2005. Major efforts are being made in further improving the climate efficiency of agriculture and to build upon the progress made to date. While leaving a gap in absolute reductions, it is important to emphasise the enormous climate efficiency ambition that is implicit in achieving a flat lining of emissions." P.57

We must note that "efficiency improvements" do not equate to climate action unless total emissions decrease. This is an obvious point that is overlooked in the document: carbon footprint = efficiency x production. An explicit policy of increasing production and therefore livestock numbers under FH2020 and 2025 means that efficiency improvements will not be sufficient to decrease total carbon footprint emissions at all. The "gap in absolute emissions" due to livestock agriculture within a national Mitigation Action Plan will have to be made up by other sectors or by costs that are currently likely to borne by the tax payer.

DAFM need to make it clear that "the enormous climate efficiency ambition that is implicit in achieving a flat lining of emissions" is due to a definite Government and agri-industry policy of

increasing livestock numbers in order to increase production for FH2020. The 'gap in absolute emissions' is therefore a government policy that is in direct conflict with Ireland's emissions reduction obligations and commitments.

> 'Carbon-neutrality' has been proposed as a "horizon point for agriculture by 2050" by the Secretariat of NESC and by the Oireachtas Committee on Environment, Culture and the Gaeltacht.
>
> Addressing climate change across the economy is now a major policy concern for government, with an approach to carbon neutrality being considered as a 'horizon point' for the agriculture sector. P.58

An ever-receding horizon with no planned cuts in total emissions is not a mitigation action plan.

> "The concept of an approach to carbon-neutrality significantly broadens the menu of options open to farmers to contribute constructively to reducing net emissions from agriculture, while at the same time growing the production and export of food. It changes the emphasis from gross emissions to net emissions (i.e. the difference between gross emissions and offsetting), which opens up opportunities to grow the industry while at the same time reducing net emissions through the incentivisation of offsetting mechanisms". P.59

There is no scientific basis for assigning all carbon sinks to agriculture. Other sectors would also like to be offset against sinks. The idea that using carbon sinks from forestry "opens up opportunities to grow the industry" is wishful thinking. Only if the Irish agricultural GHGs are part of a European or global ETS could this be the case.

> "The FAPRI-Ireland models shows that emissions would rise in the short to medium term, reaching about 22 MtCO2eq by 2030, and continue to rise at a much lower rate beyond 2030". P.59

This contradicts the statements above that emissions will flatline: projecting emission increases is not flatlining. These increases are likely untenable within a national Mitigation Action Plan to 2020, 2030, or 2050, unless transport, commercial/residential and energy are transformed to very low carbon, far faster than currently planned. This would be possible only if a sector emitting excess emissions pays for the increased ambition needed in other sectors.

3.0 Feedback Points on the Methodology of the Discussion Document

1. The consideration of long-term agricultural policy to 2030 and 2050 in a sustainable development context is a very welcome feature of the discussion document and provides a good basis for coherent stakeholder engagement. All would agree that Irish agriculture must continue to provide for the food needs of the current generation, without causing harm to the environment, while retaining or improving the productive capability of the land for future generations.

2. Inclusion of consideration of food security in an Irish and world context also represents the introduction of a long-overdue ethical dimension to this crucial discussion. While consideration of GHG/unit nutritional output is a useful metric for policy guidance, it should not be looked upon as the sole justification for increased production. In this context it is noted that none of the analyses referred to in the discussion document have considered the current net food energy imports of Ireland and of the EU. **If we are to contribute meaningfully to world food security this would need to be changed to net food energy exports.** It is suggested that future analyses should comprehensively address this aspect.

3. Inclusion of life cycle analysis (LCA) represents a useful addition to the current national inventory accounting. LCA can be used to ensure that our policies do not have perverse outcomes globally. **However it is not valid to use our low LCA emissions as a justification for increased Irish agricultural output.** Such a unilateral approach is divisive and could encourage a free-for all whereby other states increase production in specific sectors, based on claimed low LCA emissions. Since Ireland is committed to the UNFCCC we must believe and act on the basis that our sustainable future lies in recruiting more and more nations into the GHG limitation process. As this proceeds, the sum of national accounted inventories will eventually converge on the global LCA emissions. For example, as Ireland does not manufacture artificial nitrogen fertiliser, the associated emissions of nitrous oxide are included in the inventories of states from which we import the fertiliser. The same applies to imported food and animal feed.

4. The MACC analysis presented in the discussion document includes the single largest mitigation factor, which is the reduction in the suckler herd to compensate for the increased dairy herd. This is presumably to be driven by economic forces only, but if this modelling proves incorrect, emissions would increase. **Explicit consideration of the herd re-structuring should be included in future analyses, and measures should be identified which can be activated in the event that the suckler herd reduction does not proceed as planned.**

5. Organic farming is an inherently low-input and low impact form of agriculture and has potential as a cost-efficient mitigation strategy but it is not included in the MACC analysis. While it is actively encouraged by specific schemes these have evidently not been sufficient to grow it to a significant scale as organic farms currently represent only 1% of agricultural area. Much more support is required.

6. The efficiency measures identified have a projected benefit of slightly in excess of 1 $MtCO_2eq$. **As a result of the intensification of production, there will be an increase of 27% in artificial nitrogen application which would undo all of the progress in nitrogen reduction achieved over the past decade and would have to be considered a significant adverse impact on the environment.**

7. It is not clear what the implications of increased efficiency would be in terms of importation of animal feeds. As is evident from FAO statistics, **Ireland is reliant upon significant cereal imports to meet the feed demands of the existing livestock system.** Any increase in this import reliance would exacerbate the existing negative food energy balance for the state and should be considered in future analyses.

8. Understandably the MACC analysis for farm energy production was limited to biomass crops, as the scope was limited to agricultural practices. **It would be useful to include on-farm wind power in future MACC analyses.** Small to medium wind turbines have essentially no land take, require no farm labour, and provide an immediate return on investment. While noting that the benefit would not currently accrue to the agricultural sector, it would contribute to the national figures. In contrast, energy crops are land-hungry, with a gross yield of typically only 4 toe/ha, an energy output that could be obtained with just 20kW of installed windpower, i.e. a small turbine. The same considerations apply to grass to biogas such as described by Singh et al. (2010), where it was speculated that up to 390,000 ha of grassland could be available for this purpose. This would obviously compete with food agriculture and forestry. The evidence over the past decade is that biomass for energy is slow to take off and **further encouraging farmers to invest in this area may pose an unacceptable financial risk.** In particular there is no evidence that an indigenous liquid biofuels industry could survive unless it receives market protection which is not permitted in the EU.

9. The continued support of afforestation is welcomed and can contribute to economic development and environmental gains if properly managed. However it would appear that essentially no increase in target is envisaged (18% as opposed to 17% in the 1996 Growing for the Future document) and the target date has been delayed by 16 years. **If forestry is to provide significant reliable carbon sequestration to 2050, planting rates greatly in excess of those indicated in Figure 4.3 would be required.** Analysis by Teagasc shows that forests could become a net carbon source if average new plantings fall below 10000 ha/yr which is the present situation (Schulte et al., 2013).

10. Regarding use of forest carbon off-sets, it is clear that these cannot be used in meeting the 2020 targets, but may be considered with respect to 2030 target (European Council, 2014).

11. The approach taken in the discussion document whereby agriculture, forestry, land-use, wetlands and peatlands are considered in their totality has its merits. All of these form part of the current biophysical carbon and nitrogen cycles and it is logical to track the overall progress of this group towards a carbon neutral 2050. **Total annual emissions of methane and nitrous oxide (short term climate forcing GHGs) from agriculture also require substantial and sustained reductions to limit global warming in the coming decades.**

12. The aforementioned holistic approach to the land does not automatically imply that sequestration from forestry should be subtracted from agriculture only, no more than wetland emissions should be added to agriculture as is implied in Figure 5.2 of the discussion document. **Assigning a notional off-set to agriculture runs the risk of inducing complacency with regard to achieving actual emissions reductions.** If, as may happen, forests prove to be a carbon source in two decades, it would also pose severe compliance problems for agriculture. It may however be arguable that proven enhanced soil sequestration could be applied as an off-set to agricultural emissions occurring on the same land.

13. From a sustainability perspective, a robust approach to the land would be to pursue a policy of enhancing the sink capacities of forestry and non-agricultural lands, along with reductions in net emissions from agriculture (possibly corrected for sequestration on the same lands if permitted). **Any overall gain from these sinks would then accrue to the national account rather than to any specific sector.**

4.0 Feedback Points on an Agri Mitigation Action Plan

1. A short-term agricultural GHG Mitigation Action Plan (MAP) is vitally needed now to achieve rapid cuts in agricultural emissions to help meet Ireland's 2020 emissions targets that will currently be missed by a wide margin incurring large compliance costs. **Most importantly, for any significant likelihood of a sustainable future, Ireland has to meet its Copenhagen Accord commitment to act to limit global warming to 2ºC in line with science and equity, implying a definite, limited carbon budget for Ireland's future GHG emissions.** Any long-term agricultural plan should fit within the long-term total carbon budget for Ireland which would provide the basis of a science and equity-based National Mitigation Action Plan. `Ideally this plan would delineate an all-party, agreed decarbonisation pathway to a zero carbon future enabling Ireland to play its part in stabilising the global climate system and arresting further warming.

2. The discussion document accepts that climate damages will occur directly as a result of agricultural emissions yet it does not discuss the logical and commonly-accepted economic and environmental consequence: that **the polluter pays**. Agricultural GHGs could be paid for per tonne based on accepted emission factors. The costs, initially borne by the agricultural producers of the emissions, can be passed on to processors and then to the consumers of the food products. Otherwise, Ireland will continue to take the carbon leakage emissions penalty for livestock-derived food consumed elsewhere.[17]

   Instead, the resulting cost of emissions target non-compliance and emissions damages could be paid for by the overseas consumers, rather than by the general Irish taxpayer through the Government exchequer. As a document provided to the public to discuss public policy, DAFM should at the very least offer this evidence-based option for public debate.

3. **The document offers a Mitigation Action Plan without planning to deliver any defined mitigation (or in fact any mitigation of total agricultural emissions at all).** Based on current DAFM data, the EPA project that total agricultural emissions will rise to above their 2005 level and the document suggests they will stay higher than this even beyond 2050.[18]

   The discussion document should ask the public, and farmers themselves, if they believe that knowingly adding even greater amounts of climate pollution is an acceptable or responsible policy in the context of necessary climate action to prevent damage and loss to other more immediately vulnerable populations. **Continued high agricultural emissions will cause even more future climate damage** and risk to future

[17] Caro et al (2014) CH4 and N2O emissions embodied in international trade of meat http://iopscience.iop.org/1748-9326/9/11/114005/article

[18] DAFM Discussion document p.61

generations and the world's poorest. By cutting agricultural and other sectoral emissions Ireland can decide to reduce its contribution to these damages to global food sustainability and international security. We believe DAFM need to make the evidence base for these decisions far clearer.

An Taisce's position is that a Mitigation Action Plan needs to plan sustained and substantial mitigation action, starting as soon as possible, that achieves real and continuing cuts in agricultural emissions without reliance on sequestration to reduce these impacts.

4. A defined, continuous, year-on-year percentage reduction emission path could well be a much more 'climate smart' policy than the vague (potentially meaningless?) "approach to carbon neutrality as a horizon point for Irish agriculture".[19] A defined path of emission cuts would offer certainty of investment and real financial incentives to drive cuts in emissions, as well as delivering on targets and achieving actual mitigation of climate damage. Moving away from farming livestock to producing low carbon food, to farming wind and solar energy, and managing forestry could have huge co-benefits to the Irish rural economy and community as a whole, and to the world by reductions in climate and health damages.

5. **Efficiency measures that improve the 'emission factor' (GHG intensity, in tCO_2eq/unit yield or tCO_2eq/head) of beef or milk will contribute to reducing the 'carbon footprint' (absolute emissions, in tCO_2eq) if, and only if, the units produced or number of livestock head do not increase to outweigh the efficiency improvement.**[20] Despite claimed efficiency improvements, FH2020 and 2025 will steadily increase emissions from the 2011 level (which were 9% lower than 2005) by increasing herd sizes and yields, more than cancelling hoped-for efficiency improvements that may or may not be delivered.[21] Ignoring this reality, increasing emissions and adding climate damage (despite efficiency improvements), is not a climate smart 'approach' to climate neutrality simply because it is heading in the wrong direction.

6. **Economic evaluations of climate costs due to methane and nitrous oxide are available, yet in the document they are either not accepted as a basis for action, or they are not included**. The Teagasc Marginal Abatement Cost Curve references a carbon credit cost of €33 per tCO_2eq for cost effectiveness and an EU working paper suggests a €18 cost as the MACC cost to achieve 20% emissions reduction.[22] Other costings for the real damage and health cost caused by agricultural GHG emissions are much higher (likely of the order of billions of euro per year for Ireland alone). These real costs are currently unpaid simply because the pollution is not

---

[19] Teagasc (2013)Carbon Neutrality as a horizon point for Irish Agriculture http://www.teagasc.ie/publications/2013/3002/CarbonNeutrality.pdf

[20] See definitions in BSI (2011) PAS 2050:2011 Specification for the assessment of the life cycle greenhouse gas emissions of goods and services http://shop.bsigroup.com/upload/Shop/Download/PAS/PAS2050.pdf

[21] Ireland's Greenhouse Gas Emission Projections 2013-2030

[22] EU Commission (2015) An economic assessment of GHG mitigation policy options for EU agriculture Table 2, p46 https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/economic-assessment-ghg-mitigation-policy-options-eu-agriculture

regulated.[23] Regulating pollution and possible costings should at least be discussed and presented by DAFM to properly inform the public about GHG management options that are widely discussed in research on agricultural policy in response to climate change.

7. The potential benefits of agriculture within an EU ETS to cap and cost emissions to drive mitigation and to fund sequestration are not discussed. EU Commission working papers suggest that significant mitigation is unlikely without integrated policy to price emissions across all sectors.[24] A discussion of the merits and otherwise of this, with reference to EU working papers and other sources, would be helpful.

8. Section 2.2 needs to discuss the warming effects of methane in a more complete way. Given the fact that a 10- or 20-year time horizon is more scientifically relevant to the short atmospheric life of methane, any metrics noted as preferable by DAFM relative to the current 100-year reference could and should be quoted on this scientific basis, rather than the 50- and 100-year GWP and GTP values DAFM give.[25] **On a 20-year horizon, there is essentially no difference between fossil and non-fossil methane**: methane has a non-fossil GWP of 84 times that of CO_2 and a GTP of 67, far higher values than the current Kyoto-related 100 year GWP value. A letter from very senior climate scientists and related officials in the USA, including the head of the US EPA, suggests a 10 year GWP for methane would be most appropriate and that this implies a need for far more urgency in cutting methane emissions starting as soon as possible.[26]

9. In Figure 2.1, **outdated UNFCCC GWPs are stated** in separate boxes for methane and nitrous oxide. These need to be corrected in line with the AR4 ones that will be used from 2015 onward.[27] It should be noted that the new value for methane is even higher in the AR5 assessment, though lower for nitrous oxide.

10. As DAFM, Teagasc and global research makes clear, mitigation of livestock emissions is biophysically very limited making choices difficult for policy makers.[28] Over the last 20 years emissions per head of dairy cattle have increased by about 9 percent according to the EPA.[29] Estimates of resultant climate costs suggest that livestock agriculture may not be economic if climate pollution costs are included.[30] **Given the urgent and critical need to reduce emissions and the extremely resource-intensive nature of livestock-derived food, a logical response is a transition away from livestock agriculture. This may be difficult to contemplate for some but the**

---

[23] Shindell DT (2015) The social cost of atmospheric release. Climatic Change
DOI 10.1007/s10584-015-1343-0

[24] EU Commission (2015) Country Report Ireland 2015 p.63

[25] Boucher O et al (2009) The indirect global warming potential and global temperature change potential due to methane oxidation
Environ. Res. Lett. 4 (2009) 044007 (5pp) doi:10.1088/1748-9326/4/4/044007

[26] Holdren J, McCarthy G et al (2014) Recommendation to accurately account for warming effects of methane, a letter.

[27] EPA (2014) IRELAND'S PROVISIONAL GREENHOUSE GAS EMISSIONS IN 2013 p.10

[28] Donnellan, T et al (2013) Development and application of economic and environmental models to greenhouse gas emissions from agriculture: Some difficult choices for policy makers. Teagasc. 133rd EAAE Seminar

[29] EPA NIR 2014

[30] Hope C (2015) Long term costs of methane in PAGE09 climate IAM. Personal communication.

reality is that climate risks need to be mitigated and every country has difficult choices to make. DAFM should discuss this pathway option far more completely in the document.

11. **There is no scientific reason why sequestration in general from forests and soil carbon should be solely ascribed to compensating for agricultural emissions.** The government document could make this clear, even if it does not correspond to current Government policy. Other sectors would like to offset their emissions. Sequestration that occurs on a specific producer's land may rightly be ascribed to that producer but not necessarily all forestry everywhere.

12. If agriculture, forestry, land-use, wetlands and peatlands are to be considered in their totality as the current document suggests, then **the very large net emissions from drained peatland sources currently omitted from EPA accounting will more that outweigh likely sequestration.** It is likely that peatlands will be included in a global climate agreement as soon as Paris, and this would greatly add to an agricultural sector that includes all AFOLU emissions.

13. The discussion document's emphasis on sustainability is welcome. However, production that continues or increases high levels of emissions without bearing any of the very real costs is not sustainable because it damages the sustainability of agriculture and productivity elsewhere and in the future. Climate modelling makes it abundantly clear that the current growth in livestock emissions is unsustainable for scenarios with a likely chance of avoiding more than 2ºC global warming. [31] Even in the absence of climate change impacts, the added environmental impacts of increased livestock production are large and globally unsustainable. The discussion document **should ask the public if we should knowingly contribute to this pathway** or if mitigation actually requires a different path.

14. The relationship of mitigation and adaptation needs to be seen in the very difficult context of the extremely limited and rapidly depleting total global carbon budget for a likely chance of limiting global warming to 2ºC. [32] Within this total budget, the remaining carbon budget for wealthier nations, which have the capacity and responsibility for greater climate action, is extremely small compared to their current high annual rates of emissions.[33] Ireland has a high per capita emissions rate of 12.6 tCO2eq so. A commitment to equity and sustainability therefore requires that the priority is substantial and sustained mitigation of national emissions. **In conjunction Ireland will likely need to contribute to financial support for poorer countries to adapt to climate impacts predominantly caused by historic and current emissions from wealthy countries.** Again this cost would best be paid through rationing and pricing Ireland's GHG emissions including those from agriculture. Balancing payments to affected low income groups, funded by the GHG revenues, would be required.

---

[31] DECC (2015) The Global Calculator http://tool.globalcalculator.org/globcalc.html?levers=22rfoe2e13be1111c2c2c1n31hfjdcef222hp233f211111fn2211111111/dashboard/en

[32] IPCC AR5 WG1 p.27

[33] Anderson K, Bows A (2012) Nature Climate Change, Vol 2, Sept p.639-640

15. The discussion **document makes no mention of encouraging human dietary change as part of climate mitigation action**.[34] Reduced meat and dairy consumption can be encouraged by increasing public awareness of the high GHG emissions related to livestock-derived foods and by pricing in the externality of the costs of GHG pollution. Ensuring that consumers pay for the costs of climate pollution caused by this consumption would help to drive reductions in demand for higher carbon agricultural products and thereby drive a rapid transition to a very low carbon society.

[34] IPCC AR5 WG III (2014) *Agriculture, Forestry and Other Land Use (AFOLU)*. p. 829.

5.0 Proposed Revised Mitigation Action Plan for Agriculture

Taking all these factors into account, **a revised Mitigation Action Plan for agriculture in Ireland needs to be developed**.

In the view of An Taisce it must include:

a. A substantial and sustained **public information campaign** stressing the urgency of strong, near-term cuts in GHG emissions commensurate with the authoritative IPCC statement from climate science that "limiting climate change will require substantial and sustained reductions in greenhouse gas emissions'.

b. A definite emission **reduction path for agriculture emissions** (separate from any sequestration adjustments) as part of Ireland's national mitigation action plan within a total carbon budget for Ireland to 2050 calculate to avoid 2ºC global warming, in line with science and equity and as agreed in the Copenhagen Accord, 2009.

c. Consequently, a steady **transition away from livestock agriculture** into farming that prioritises low carbon products, renewable energy and sequestering carbon, with investments in the transition initially funded by:

d. A price on methane and nitrous oxide pollution, as well as CO_2, appropriate to the likely total resultant climate damage, as modelled by science and economics, so that the polluter, ultimately the consumer of food products, pays.

e. Stressing that it is the **full carbon footprint of agriculture**, the total emissions that must be cut to play a part in Ireland's transition to a low carbon economy within 35 years. Efficiency can help, but livestock emissions per head are very difficult to improve, so it is very likely that beef cattle numbers in particular must fall to achieve cuts in emissions.

f. If there is an insufficient price on agricultural GHG emissions to drive mitigation or insufficient mitigation is targeted, **then any Mitigation Action Plan needs to state why other sectors or the general taxpayer should bear the additional costs** of emission target compliance due to the failure to mitigate.

6.0 Contextual Considerations Not Present in the Discussion Document

6.1 Carbon Sequestration and Joined Up Thinking

6.1.1 Peatlands

An Taisce urges DAFM **proactively to engage with all government departments** with a stake in Ireland's peatlands for the greater good of GHG mitigation. At present, four departments (Dept of Environment, Dept of Arts & Heritage, Dept of Agriculture and the Dept of Finance) increasingly recognise peatlands as a valuable store of carbon but another department (Energy) is seeking approval to put a scheme in place to give out consumers' money to extract and burn the same resource as a source of fuel. This is not coherent policy making.

Peatlands are one of the world's most important ecosystems. Covering a mere 3% of the world's terrestrial surface, peatlands contain 550 Gigatonnes (Gt) of carbon making them **the most important long term carbon sink** in the terrestrial biosphere. This ability of peatlands to store CO2 and other greenhouse gas means they have a net cooling effect on the global climate. It has been estimated that in the 10,000 years since the last Ice Age the atmospheric carbon sequestered in peats has served to reduce global temperatures by about 1.5 – 2 °C.

In terms of encouraging the fostering of terrestrial carbon sequestration Ireland is uniquely placed. The Republic of Ireland is third only to Finland and Canada in proportional area of peatland cover. According the EPA's Bogland report (2011) peat soils cover 20.6% of Ireland's national land area and contain more than 75% of the national soil organic carbon. **Near-intact peatlands may actively sequester c. 57,402 t C/year** over the whole country.

Neither our past nor our current management of peatlands in Ireland has been sustainable. Disturbances in the form of industrial and domestic peat extraction, private afforestation, overgrazing, wind farms and recreational activities have had and are having major negative impacts on the hydrology and ecology of these habitats. **There are no more intact raised bog landscapes in Ireland.** The current area of active raised bog stands at a mere 2,000 ha, less than 6% of the protected raised bog area. It is estimated that between 2% and 4% (40–80 ha) of this active area is being lost every year mainly as a result of turf cutting. Even if turf cutting were to cease, peat oxidation would continue (due to drainage) unless measures were employed to stop and revert the deterioration. Damaged peatlands are a persistent source of carbon dioxide (CO2) and, at the national level, Irish peatlands are a large net source of carbon, estimated currently at around 2.64 Mt C/year.

Carbon dynamics should be a key driver of Agri Policy. The rewetting and restoration of peatlands has the capacity to secure existing carbon stocks and reinitiate the carbon sequestration capacity of degraded peatlands. International climate change talks have agreed that carbon savings from rewetting drained peatlands and other forms of peatland restoration may be used to meet emissions reduction targets, alongside those from other land use

activities such as new forest planting.

Peatland restoration projects have been recognised by the Kyoto Protocol and should be incorporated into government policy across all relevant Departments. Active and remedial management options, such as avoiding drainage (conserving) and re-wetting may be effective ways to maintain the carbon storage of peatlands and to recreate conditions whereby the peatland may actively sequester carbon in the future.

6.1.2 Forestry

Outside of commercial forestry and native woodland establishment, the enhancement of hedges/trees/field margins have been identified as a way to improve carbon storage across the Irish landscape. While Ireland was once largely covered in broadleaf woodland we now have the second lowest level of forest cover in the EU. **Globally Ireland therefore is one of the countries with the greatest potential for afforestation.**

One of the aims of Ireland's national forestry policy is to encourage planting by private landholders in order to achieve a forest cover of 18% by the year 2046. This is a conservative goal given the fact that the EU average is above 30%. At the end of 2012, forests covered 10.5% of the Ireland's land area.

Forestry is one of the tools which must be fully utilised nationally to deal with the threat posed by climate change. **By increasing Ireland's forest cover a significant carbon sink will be established.** Increased native forest cover would also provide other ecosystem services such as flood mitigation and it could provide a sustainable source of biofuel to offset future reductions in fossil fuel use. Biofuels produced through coppicing native species of willow (Salix), alder (Alnus glutinosa) and birch (Betula pendula and Betula pubescens) could be used as an alternative to turf thereby facilitating the conservation of our peatlands.

DAFM must be become informed of the current situation globally in relation to carbon credits. There may be the possibility that a scheme could however be developed within Europe that focuses on the role of conservation, sustainable management of forests, and the enhancement of forest carbon stocks.

However, as is the case with any of these environmental actions that affect carbon conservation and sequestration, the need to enhance and improve this must also be considered against the potential difficulties in terms of measurement, controls and verification of carbon sequestration.

6.2 The Flawed Interpretation of 'Sustainability'

'Sustainability' as a concept as it is presented throughout the discussion document appears to refer to short-term profitability, purely in a near sighted economic context rather than the correct meaning: "development which meets the needs of the present without compromising the ability of future generations to meet their own needs."

The discussion document places particular emphasis on the importance of the economy. It should be remembered **the economy is a 'wholly-owned subsidiary' of the natural**

environment – on the island of Ireland, regionally and globally**.** An unhealthy environment will result in an unhealthy society and economy and ultimately in collapse of the ecosystems on which society and civilisation depends. Although the link between sustainable economic development and natural resources has been widely ignored and eschewed by conventional economic policy makers, the onset of climate change and energy scarcity is precipitating a long overdue reappraisal of this costly misjudgment.



The Economy is a subset of the Environment and Society

Understandably much of the current national political and media focus is on promoting economic development and employment. All mainstream commentators and politicians eulogise the accepted wisdom of the virtues of a return to economic growth as the conventional solution to our current economic, unemployment and fiscal difficulties. However, it should be borne in mind that there is an inherent contradiction between the current model of economic growth and environmental and resource sustainability. Our society is currently locked into an economic system that has a GDP growth imperative that is based on increasing fossil fuel energy demand, increased greenhouse gas emissions, especially from transport and agriculture, and increased resource throughput and depletion.

Ecological debts are as unstable as financial ones. Neither is properly accounted for in the relentless pursuit of unsustainably-based consumption growth. This contradiction is placing further pressure on the carrying capacity of the environment to support society and the economy. Claimed 'growth' based on decreasing future capacity is not growth, like the 'Celtic Tiger's' burst bubble it will prove short-lived unless a radical change to a sustainable course can be achieved through public involvement and strong planning. If the rest of the world does not also change course then at least Ireland could develop a more resilient course in an increasingly dangerous future.

Current efforts are additionally hampered by using GDP as a measure of economic growth. GDP is a highly imperfect and counter-productive measure of human progress as it measures only income and does not account for the consumption of natural capital (resources), social inequality or the significant costs of anthropogenic pollution[13].

For example, a 2 per cent per annum growth in GDP would mean the carbon occasioned

by each unit of economic output would have to be 130 times lower in 2050 than it is today otherwise we cross a threshold in terms of carbon emissions from which future generations will be unable to recover. Economic growth is therefore inconsistent with the requirement to abate greenhouse gas emissions or reduce oil dependency. In any event,

2% GDP growth would mean the total size of the Irish economy would double every 35 years. This is not physically possible in a finite world and we should therefore not be planning for it. To seek to double the size the economy over the next 30 to 40 years is counterproductive; to meet with success with such a wrong-headed objective is to further impoverish our children and their children.

Current Government policy is to promote the Smart Economy and a return to an export-led economy. While this strategy has many virtues it is based on the premise that Ireland cannot compete with manufacturing industries in low-cost developing nations in a globalised economy. As a consequence, the structure of modern developed economies such as Ireland has typically tended to move progressively away from domestic manufacturing resulting in more and more finished and semi-finished goods needing to be imported from abroad and expanding the financial and services sector to pay for it. Of course, this strategy is extremely vulnerable to global economic instability, oil price inflation (for transport) and outsources environmental degradation to less regulated countries.

Current national economic development policies, including Food Harvest 2020 demonstrate a long-term blindness to the limitations of the physical world. Responses to the crisis which aim to restore the status quo are misguided and doomed to failure. Income today means nothing if it undermines the conditions upon which the prosperity of tomorrow depends.

Continued GDP growth based on the current economic model is unsustainable in the long-term. It is prudent to plan now for a different economic future including low-growth, no-growth or contraction scenarios. Government policy, including the Agri sector mitigation plan, must take this into account and plan for externalities such as plan for higher and more volatile energy prices (and high material costs too) and to use this window of opportunity to transition the country into a post-carbon, low energy, low consumption and resilient state.

7.0 Conclusion

The agriculture sector must play its part in the transition to a low-carbon society and economy and mitigate the significant risks associated with climate change adaptation.

It is critical that the urgency of necessary rapid and deep decarbonisation is also appreciated by the public. The forthcoming Climate Action Bill which the Agricultural sector mitigation action plan feeds into needs a strong focus on public engagement to increase the level of debate. Any transition to a low carbon future must be based on the reality of cumulative carbon budgets including the need to regulate total annual emissions of agricultural methane and nitrous oxide. This should be informed by the work of the IPCC and the monitoring of the EPA, otherwise short-term political deference to local preferences and short-term cost saving will in the long-term prove costly both socially and economically to Ireland and the world.

The international and national economic recession has provided a narrow window of opportunity to take action to concentrate investment and focus policy on the transition to a post-oil, low-carbon, globally respectful and locally resilient society. DAFM is pursuing exactly the opposite. **This is the major challenge of our time and requires urgent understanding of the nature and scale of the unprecedented consequences which will confront us if we do not take dramatic action in the near-term.**

This will require decisive political leadership and a radical change of direction together with robust and, in some instances, radical policy implementation that will only be politically acceptable in the near-term if the risks are effectively communicated to the public. The coordinated actions of all government departments are critical to effective action and the statutory planning system, through the regulation of physical development and land use, has a critical role to play in facilitating this transition.

The success or otherwise of the forthcoming Climate Action and Low Carbon Development Bill can only be judged against verifiable and implementable criteria which are subject to ongoing monitoring to enable substantial and sustained cuts in total emissions achieve Ireland's part in limiting climate change.