An Taisce
The National Trust for Ireland

An Taisce's Response to the Public Consultation on the Development of the National Mitigation Plan (NMP)

An Taisce Climate Change Committee (ATCC)

July 2015

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Glossary

AR5	The Fifth Assessment Report by the IPCC, published 2013 to 2014
ATCC	An Taisce Climate Change (Committee)
CCAC	Climate Change Advisory Committee, an expert advisory group set up by the Climate Action and Low Carbon Development Bill 2013
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent (includes all GHGs including methane and nitrous oxide)
CoP	UNFCCC Conference of the Parties (next is Nov 2015, Paris)
DAFM	Department of Agriculture, Food and the Marine
DECLG	Department of Environment, Community and Local Government
DECC	UK's Department of Energy and Climate Change
EBT	Used in this document to signify combined grouping in the National Policy Position of: Electricity generation, Buildings and Transport
ETS	Emissions Trading Scheme
GHG	Greenhouse Gas
IAM	Integrated Assessment Model, combining climate and economic models
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
nett	Describes total emissions minus total sequestration
NMP	National Mitigation Plan
Non-ETS	Non-traded national domestic emissions (transport, agriculture and buildings_ limited by the EU 2020 target of a 20% reduction relative to 1990.
NPP	Climate Action and Low-Carbon Development National Policy Position. This is the Government's current outline mitigation plan.
ppm	parts per million
SEAI	Sustainable Energy Authority of Ireland
tCO_2	tonnes of carbon dioxide
UNFCCC	United Nations Framework Convention on Climate Change

Executive Summary

Ireland's National Mitigation Plan must set out a carbon-budgeted pathway to a net-zero carbon[1] future for the Irish economy by very soon after 2050. This massive challenge requires enormous societal engagement with the reality of climate change to build cross-party political support for the necessary decarbonisation. To date, our society as a whole – government and citizens, business, agriculture and media – has failed to make the necessary collective effort to understand and set an emission-cutting course to deal with climate change. It may still be possible to chart a transition course to regain climate stability, if we act strongly and quickly at every level – local, national and global – focusing on the global.

Any feasible +2ºC National Mitigation Plan requires a pathway of steadily declining emissions, decreasing year on year up to 2050 and beyond. To achieve sustained and substantial reductions, annual emissions cuts of 5% or more per year are likely to be necessary. A +2ºC pathway very likely requires energy emissions to be cut by 80% within 15 years, requiring peat and coal use for energy and heating to be phased out very rapidly. This kind of change will require a national emergency level of effort to enable Ireland to play its part in the global challenge of climate change. Only through hard and enforced caps on emissions can conservation and efficiency savings be realised – otherwise local and national efforts are likely to be futile in achieving effective climate action to limit warming.

Agriculture and transport emissions, currently rising, will also need to drop fast, and be costed for, within traded systems aligned with the +2ºC target to realise efficiencies effectively. Low GHG land use, renewable energy, a timetable for rail electrification and networked public transport are needed. Rising taxes on all GHGs embodied in foods, goods and services will be needed for society's transition to a low carbon future. Consumption of these high GHG products is irreversibly and dangerously compromising the future of the global economy for all generations to come. A very different low carbon economy is needed.

Climate justice, fairly sharing the remaining global carbon budget for +2ºC, to enable sustainable development for poorer countries and future generations, requires an equitable rationing of the remaining global carbon budget among nations, among citizens and through time. A primary task of Ireland's new independent Climate Change Advisory Council must be to assess Ireland's approximate equitable share of the +2ºC global carbon budget based on the best available peer-reviewed modeling and evidence.

In this regard, An Taisce's analysis suggests that the current National Policy Position is wholly inadequate. It evades statement of a cumulative carbon budget, fails to define a specific pathway of emission reductions, allows increased near-term emissions, does not even acknowledge (never mind respect) the moral obligations of climate justice, is sectorally biased (without any articulated basis or criteria), and tacitly commits future Governments and Irish citizens to progressively more unachievable rates of decarbonisation. The National Policy Position is vague, unscientific, sectorally biased and morally unjust. Its apparent intent is to avoid public discussion and evade political decision-making. It will be up to the Climate Change Advisory Council to present independently evidenced, unbiased and

[1] Throughout this submission "carbon" should be taken to encompass all anthropogenic emissions of greenhouse gases (allowing appropriately for their complex distinctions and interactions, including very different residency times and warming potentials).

equitable, alternative carbon-budgeted pathways that accord with the +2ºC limit in place of this fundamentally flawed NPP. The time for procrastination is over. Meaningful political decisions have to be made.

A National Mitigation Plan and any reality-based +2ºC transition pathway requires far more urgent and radical change to Ireland's economy and society than the NPP or the DECLG consultation document envisage. A Plan for total emissions from energy, food, goods and services to go to near-zero net carbon by 2050 is critical to limit risk of near term climate impacts to levels still compatible with managed adaptation, and then to ensure sustainability for future generations.

2 Summary of An Taisce's NMP Submission: Nine key points

1. A cap on TOTAL future national greenhouse gas emissions is critical to realising effective climate policy. Otherwise, short-term, apparent savings in energy and cost will be spent at some point in the future, by us or by others, thereby wiping out local and sectoral efforts. Savings in CO_2 emissions have to be 'forever' to be meaningful (net CO_2 emission rate must go to zero). Cuts in emission rates of other short lived greenhouse gases (especially methane), mainly from agriculture, need to be deep and essentially permanent to effectively limit global warming. Permanent reductions in agricultural emission rates are possible while still maintaining or, better, growing, total nutritional output. By contrast, the rhetoric of 'flat-lining' agricultural emissions (i.e., failing to cut emission rates) is not mitigation at all. It is obfuscation.

2. The National Mitigation Plan requires a fully independent expert assessment by the Climate Change Advisory Committee of the equitable future remaining carbon budget for Ireland. This stated goal is the national fair claim on the global carbon budget (based on a prudent chance of limiting global warming to a maximum of +2ºC above pre-industrial – i.e., with probability significantly better than a reckless 50:50 coin toss). This goal is needed to state the necessary ambition in line with our international commitments to act in accord with science and equity.

3. Climate science and policy analysis in the IPCC's recent Fifth Assessment Report shows that the world and Ireland requires a target of ZERO nett carbon emissions by soon after 2050 to possibly limit warming to less than +2ºC. (We discount here any policy that would instead rely on entirely speculative availability of large scale "negative emissions" technology in the second half of this century: such policy would essentially gamble our children's very survival just to avoid confronting our own clear and present responsibilities; it would be morally and ethically indefensible.)

4. We assume that the CCAC will choose to carry out an urgent assessment of possible alternative transition pathways that meet Ireland's equitable future remaining carbon budget. If other nations do not follow then climate chaos is certain. Ireland must lead with a Plan that respects the science and equity for a +2ºC limit. Otherwise, we are accepting failure and planning for disaster.

5. As part of NMP planning, prior to and alongside CCAC assessment, Government needs to present a well-funded, continuing and coordinated strategy of engagement with the Irish people to greatly increase awareness of the benefits of urgent, pro-active, and radical climate change action – and the essentially incalculable potential costs of continuing delay. This honest dialogue has been postponed for far too long

and is now vital to ensure future political commitment for the climate action a realistic NMP implies.

6. In parallel the NMP requires concentrated and sustained Irish international diplomacy to push for strong EU action to cap total future EU and global emissions as soon as possible. This will be extremely difficult to achieve, of course; but without clear and unilateral commitment at home, it will be all but impossible.

7. Political leadership, backed by increased public understanding and all-party political support, will need to decide the most achievable and feasible pathway within the above constraints. To date, Governments have failed to indicate the level of burden-sharing between sectors. This cannot continue, a strong evidence-based debate is needed. Evasion cannot go on, hard decisions have to be made.

8. The analysis presented in this document by An Taisce strongly suggests that the National Policy Position, as currently stated, is not fit for purpose. It does not specify a pathway or cumulative target (unlike the EU 2020 Non-ETS target). Further, it is biased towards sheltering agricultural emissions in particular, without any objective explanation or justification.

9. Instead of relying on the current highly dangerous path of continuous growth in material consumption, based on high GHG policy in energy production, transport and livestock agriculture, we can choose equitable resilience through societal change, low carbon energy and land-use change to forestry, renewables, and improved energy efficiency – within a GHG cap.

Our current course is locked into denial of the implications of climate science and the demands of human equity: it can lead only to despair. But if based in reality, Ireland's NMP can support other nations around the world to do the same, to limit emissions urgently and deeply, and so meaningfully limit climate change. We can set out on such a hopeful and equitable path by starting now. But the first, unavoidable, challenge is to state clearly and honestly how perilous our situation has already become.

Table 1: Climate Science and Policy – Objectives, Governance and Results

Scientific or Policy Objective Levels Expert evidence in green Political decisions in blue	**Primary decision-making body or bodies (Global down to Ireland)**	**Summary of results to date**
Scientific and expert study of the global climate system and human role in affecting it: Scientific & expert reporting on physics of climate system; risks of past and continued GHG emissions; and mitigation options to limit warming.	Intergovernmental Panel on Climate Change (IPCC) Five assessments to date each with a Synthesis Summary for Policymakers (essential reading)	**Warming is unequivocal. Human-caused emissions explain all of the warming. Risks of continued emissions are very large.** Stopping climate change requires ZERO net emissions by soon after 2050. Cumulative (historic + future) CO_2 emissions determine future warming and climate change.
Global political agreement on climate target. A value judgment informed by political preferences and climate science (IPCC WG2)	UNFCCC CoP meetings. G7, OECD, EU, other blocs of nations, and individual nations.	**Limiting average global warming to a high probability of no more than +2°C** is the agreed limit for UNFCCC and OECD (including Ireland).
Climate scientific assessment of the +2°C limit target (as agreed by global political governance).	IPCC Working Group and Synthesis Summary for Policymakers reports.	**To limit warming to +2°C will require limiting total future emissions of CO_2 and flows of shorter-lived GHGs: there is a global carbon budget for +2°C**
Global political agreement on dividing the global carbon budget for +2°C among nations and paying for mitigation, adaptation and climate damage.	UNFCCC. The next two week long CoP will be held in Paris this year, starting in late November.	No agreement. Emissions have risen unabated with annual emissions rate to atmosphere doubling every 40 years. Currently on track for very dangerous irreversible warming of +4°C or more by 2100 unless radical mitigation or unknown ("deus ex machina") technologies.
Sub-global regional political climate targets	For Europe, the EU	Burden-sharing to cut domestic emissions by 20% by 2020 relative to 1990 (will be achieved). Like other blocs, EU targets are not well aligned to +2°C nor are they rigidly enforced or robust against inter-regional leakage/transfer.
Establish Ireland's equitable share of the remaining global +2°C carbon budget and possible Irish decarbonisation pathway options within that budget.	Climate Change Advisory Committee (based on IPCC WG3 and other peer reviewed evidence)	First meeting will be later this year. Independence is critical for unbiased assessment. Membership by appointment with no public process or scrutiny; unclear whether mix of expertise is fit for purpose.

Political agreement on long-term (15 plus year) mitigation pathway within Ireland's stated carbon budget	Public debate and cross-party agreement to set long-term +2ºC pathway.	**No intentional, effective national mitigation has yet been achieved by any Irish Government.**
Succeeding Governments will ensure that policies will meet carbon budgeted pathway for their five years in Government	Cabinet and Cabinet committees. Government, other political parties, and citizens.	Would monitor and ensure five yearly progress along decarbonisation pathway to zero carbon economy by soon after 2050. This requires a radical change in policy focus toward urgent and effective mitigation.

3 Outline Constraints on any Credible NMP

This section summarises key constraints that An Taisce believes the new Climate Change Advisory Council (CCAC) will need to consider, in an independent and unbiased way, as limits on Ireland's National Mitigation Plan. The overriding constraint that drives a need for urgent mitigation of climate change by cutting emissions is the physical reality of the Earth's climate system. The IPCC assessment has confirmed that there is a defined, future remaining carbon budget range for limiting temperature rise to +2ºC. This budget is currently being exhausted extremely quickly. Economic and political preferences that do not achieve mitigation action in line with cutting future emissions, in accord with this physical reality, amount to wishful thinking that is putting the economic and societal viability of future generations at grave risk.

To date, misleadingly optimistic climate policy rhetoric – both globally and nationally – has not limited global emissions, which have increased by 60% since the 1992 Rio Earth Summit. Despite cuts in domestic emissions in developed OECD nations, once measures of emissions embodied in net imports are considered it becomes clear that these nations have in fact achieved almost no aggregate mitigation. Due to this massive ongoing failure, global and national climate policies will now require radical emission reduction pathways, within defined carbon budgets. (The "alternative" is – knowingly – to condemn today's children to experience progressive and chaotic disruption of the global climate system, with intensifying and globalized impacts, and utterly inadequate time and capacity to adapt in any managed, humane or equitable way.)

A National Mitigation Plan that deliberately chooses the extreme risks of half-measures or procrastination now, driven by perceived short-term economic "efficiency" or temporary local "self-interest", cannot be acceptable – economically, societally or morally. Costing these risks and including the many co-benefits of climate action (improved air quality, decreased deaths and injuries from fossil fuel extraction, improved health due to better insulated houses, improved diets and lifestyles, and many more) would result in quite different estimates of feasibility and "cost effectiveness".

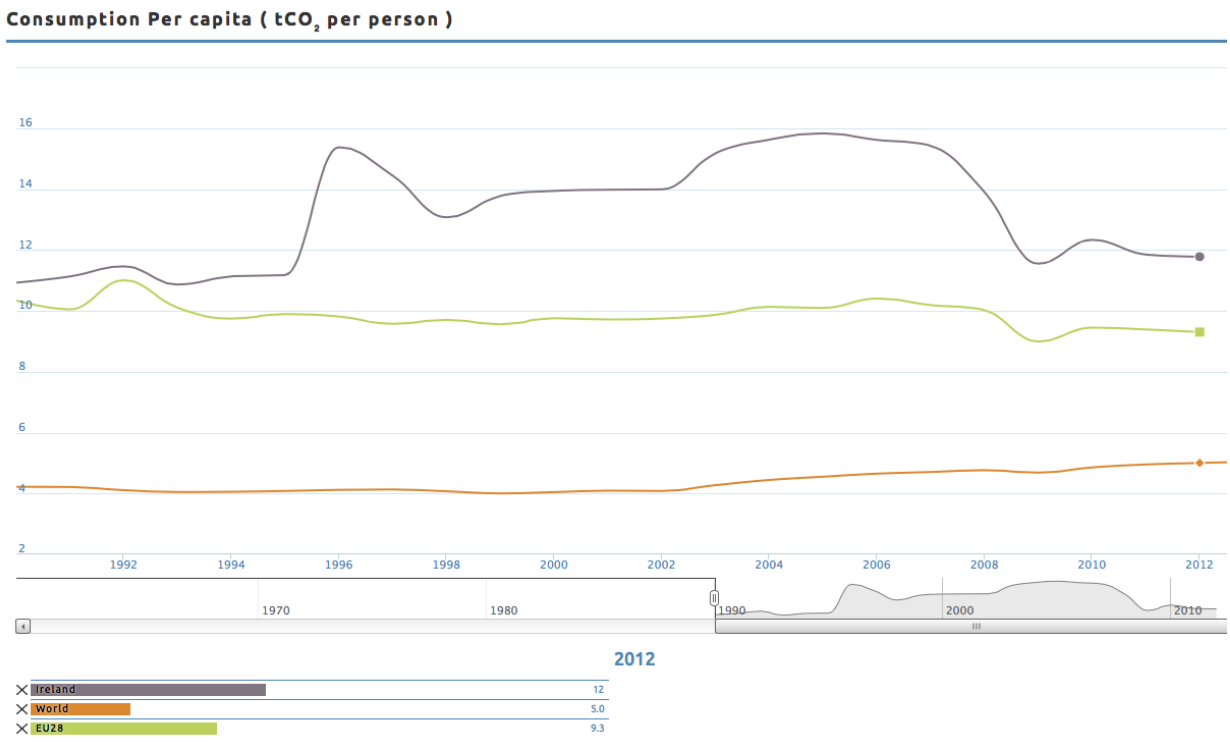


Figure 1: Ireland, EU and World CO_2-only consumption emissions per capita averages for 1990 to 2012 with 2012 data below chart. Ireland's consumption emissions history, in black, has mirrored economic performance. As yet there is no evidence that this tight coupling of emissions and growth will change - the EPA project increasing emissions with economic growth (given current policies). The EU has managed only a 4% decrease since 1990 (and that only by ignoring exported "consumption" emissions). Continuing growth will very likely raise consumption emissions.[2]

3.1 Ireland's International Climate Agreements and Declarations

Ireland, as a developed country and party to the UNFCCC[3], has committed to:

> protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

Within the UNFCCC Copenhagen Accord[4], **Ireland has already agreed to act in a way consistent with holding "the increase in global temperature below 2 degrees Celsius, and take action to meet this objective consistent with science and on the basis of equity."** Article 2 of the Accord also states:

> We should cooperate in achieving the peaking of global and national emissions as soon as possible, recognising that the time frame for peaking will be longer in developing countries and bearing in mind that social and economic development and poverty eradication are the first and overriding

[2] Global Carbon Atlas (2015)
[3] UNFCCC (1992) UN Framework Convention on Climate Change
[4] UNFCCC (2009) Copenhagen Accord

> priorities of developing countries and that a low-emission development strategy is indispensable to sustainable development.

Politically, Taoiseach Enda Kenny, speaking at the climate summit in New York in Sept, 2014 stated[5]:

> Leaders must show conviction, clarity, courage and consistency in their actions. Conviction.... that targets are fair and achievable. Clarity.... in knowing that our targets will keep the rise in global temperatures below 2 degrees. Courage.... to step up to the mark. Consistency.... in implementing policy, and creating a credible track record.

3.2 The Total Remaining Global Carbon Budget to Limit Warming to +2ºC

Climate science has now clearly shown that the total amount of additional carbon dioxide (CO_2) that can ever be emitted to the atmosphere by humanity to stay within any set temperature target is limited. The IPCC AR5 assessment confirmed that, as of 2011, for a 2 in 3 chance of limiting to +2ºC the total remaining global carbon budget was 1010 $GtCO_2$ (± 260 Gt). However, it is estimated that approximately another 150 $GtCO_2$ have already been released in the period since 2011[6], reducing the central estimate of the remaining global carbon budget to just 860 $GtCO_2$.

We note that a 2 in 3 chance of limiting to +2ºC still gives a high 1 in 3 chance of exceeding the +2ºC limit. If future global emissions exceed 870 $GtCO_2$ then breaching +2ºC becomes more likely, which would certainly not be in line with "knowing that our targets will keep the rise in global temperatures below 2 degrees". Even if annual emissions rates stay the same ('flatline') then each year's CO_2 emissions would still add to the long-lived accumulation in the atmosphere. Shorter-lived GHGs, like methane and nitrous oxide from Ireland's cattle, also continually add to warming (though because of their shorter atmospheric lifetimes, the more critical parameters are the annualised emissions rates rather than cumulative amounts as the latter do decay noticeably even on human timescales). But clearly if emissions rates of these GHGs increase, then the cumulative CO_2 budget decreases accordingly. Reducing flows to the atmosphere of shorter-lived GHGs (methane, nitrous oxide, CFCs and ozone), as well as limiting the cumulative addition of CO_2, is critical to effective climate policy action, especially for the immediately coming decades.

For all humanity, those living and those yet to be born, the +2ºC global carbon budget is a zero sum equation: using more of it now means less for others in the future. The same challenging reality is true within any single nation's claimed share of the global carbon budget: more used now by us will mean less for ourselves and our children in the future. Committing by our emission choices now inexorably to exceed the global 2ºC carbon budget

[5] Enda Kenny (2014) Address by the Taoiseach to UN Secretary General's Climate Change Summit, New York, 23 September 2014

[6] Kevin Anderson, *Letter to the [UK] Prime Minister outlining how 2°C demands an 80% cut in EU emissions by 2030*, 22nd October 2014.

directly determines the future risks of disruptive or catastrophic climate damage, and incalculable costs of adaptation, biodiversity loss and suffering.

It is very clear, even from the cautious, authoritative assessment of the IPCC, that the collective decisions of humanity are now determining the future of the biosphere of planet Earth for thousands of years to come – threatening or stabilising the essential support system that sustains and enables all long-term possibility of human health and prosperity.

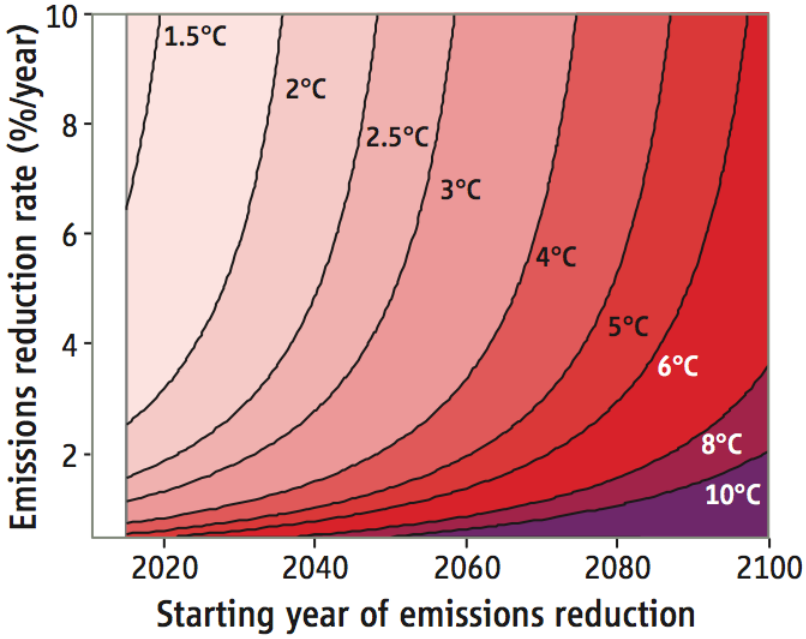


Figure 2 Global average emission reduction rates for different global climate targets, following a peak global emissions year that is the starting year of global emissions reduction. Note the 2ºC line: if global peaking is delayed to 2030 or later, this limit quickly becomes completely infeasible in any managed way, rapidly requiring from 6% up to over 10% per year emission reduction rates within five years. Even with peaking as "early" as 2020, the +2ºC limit then requires a sustained global average decarbonisation rate of 3% cuts in total emissions every year thereafter.[7]

The level of economic and social change implied by any "tolerable" (non-catastrophic) climate target will escalate rapidly over the coming three decades. As shown by Thomas Stocker (Lead Author of IPCC's Working Group 1, The Physical Science), see Fig. 2, peaking after 2030 rapidly makes meeting the +2ºC limit essentially impossible and even peaking in 2020 requires a global average decarbonisation rate of 3% cuts in total emissions every year thereafter. Delaying a peak date and/or not achieving and sustaining the corresponding post-peak decarbonisation rate inevitably breaches the +2ºC carbon budget, and commits us to ever more dangerous trajectories of climate disruption.

Relative to other nations, Ireland has very large emissions of methane and nitrous oxide due to its ruminant-dominated agriculture. These greenhouse gases are shorter lived than CO_2 but have a significantly greater warming effect per tonne emitted, a fact that has been misleadingly presented by the Department of Agriculture. Their framing in the recent agriculture sector mitigation discussion document section on climate metrics fails to

[7] Stocker T (2013) The Closing Door of Climate Targets VOL 339 SCIENCE

appreciate that a +2ºC focus makes beef agriculture increasingly and rapidly uneconomic within the next decade (see research on climate metrics for livestock emissions[8]).

Ripple et al (2014) state[9]:

> We focus on ruminants for four reasons. First, ruminant production is the largest source of anthropogenic CH_4 [methane] emissions and globally occupies more area than any other land use. Second, the relative neglect of this greenhouse gas source suggests that awareness of its importance is inappropriately low. Third, reductions in ruminant numbers and ruminant meat production would simultaneously benefit global food security, human health and environmental conservation. Finally, with political will, decreases in worldwide ruminant populations could potentially be accomplished quickly and relatively inexpensively.

and

> Because the Earth's climate may be near tipping points to major change, the need to act is increasingly pressing. Lowering peak climate forcing quickly with ruminant and CH_4 reductions would lessen the likelihood of irreversibly crossing such tipping points into a new climatic state. Reducing the numbers of ruminants will be a difficult and complex task, both politically and socially. However, decreasing ruminants should be considered alongside our grand challenge of significantly reducing the world's reliance on fossil fuel combustion.

The Global Calculator[10] (produced by DECC in the UK) is a very useful tool to assess the carbon budget for +2ºC and other policy pathways by adjusting different global policy levers. **Using this tool we note that it is extremely difficult to achieve any +2ºC global pathway without strong ambition on dietary behavior change**: to limit calories consumed, to limit the quantity of meat consumed and to limit the amount of ruminant-derived food supplied.

For example, setting the calculator to the RCP2.6 example pathway, the IPCC emissions scenario that would (with some reasonable probability) stay within the +2ºC target, requires ambitious action to limit the amount of meat (and dairy) consumed and the proportion of ruminant meat and dairy produced. **Using this 2ºC scenario and changing only the diet levers toward the increasing amounts of global consumption that Irish agricultural policy is planning for, more than doubles cumulative global carbon equivalent emission, leading to an estimated +4ºC warming by 2100.** Any climate aware livestock agricultural policy must therefore achieve pathways that work within

[8] Persson et al (2015) Climate metrics and the carbon footprint of livestock products: where's the beef?
[9] Ripple et al (2014) Ruminants, climate change and climate policy. Nature Climate Change
[10] DECC (2014) The Global Calculator

ambitious caps on meat and dairy consumption aligned with a +2ºC limit; otherwise policies are innately climate dumb rather than 'climate smart'.

3.3 Risk Assessment: All uncertainties imply greater precautionary action

The most important basis for all climate policy decision-making is risk assessment. The UNFCCC (Article 2, Principle 3) enjoins the Parties, including Ireland, to

> take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures

The IPCC Working Group 2 risk assessment of future climate impacts makes it very clear that exposed and vulnerable people and ecosystems are already experiencing damaging climate change. Above +2ºC warming, damage will be widespread and increasingly dangerous. The current course – shared in by Ireland due to its lack of effective emissions reduction – is toward catastrophic global warming of +3 to +5ºC by 2100, continuing to even higher temperatures beyond 2100. Humanity faces a choice between the current high emissions pathway with catastrophic impacts or a far safer low emissions world with far lower risks of highly damaging impacts.

Some changes may be relatively incremental or linear, such as ocean water expansion, surface temperature change or ocean acidification. However, there is strong evidence that continued high emissions will push some parts of the climate system past major tipping points to abrupt change (e.g. ice sheet collapse and crop tolerance) or toward irreversible change (ever increasing excess mortality from heat waves). Whether linear or non-linear these changes are extremely dangerous and are outside all human experience. Only serious ongoing cuts in emissions can limit this path to extreme danger.

The IPCC carbon budget depends on what probability of exceeding +2ºC is viewed as acceptable. Many scientists and most developing nations view exceeding +1ºC or +1.5ºC as highly dangerous so would not accept even a low probability of exceeding +2ºC, meaning a relatively much lower future available carbon budget.

The IPCC carbon budget also assumes a central value of the sensitivity of the Earth's climate system to carbon emissions (about +3ºC for every doubling of atmospheric CO_2 concentration). At present we are on course for two doublings by the end of this century. If we are lucky the remaining global budget for +2ºC could turn out to be somewhat larger than 870 $GtCO_2$ (if the climate system proves to be somewhat less sensitive to CO_2); but it is just as likely that the natural system is highly sensitive to CO_2, resulting in greater warming and implying a much lower carbon budget for +2ºC. Even the 2 in 3 chance +2ºC carbon budget noted above includes a significant uncertainty (more than 5% risk that the sensitivity proves to be more than +5ºC for every doubling). Any sensible, precautionary approach to risk assessment assumes that policies must be constrained by the existence of even low risk

of “high” impacts from increased warming, i.e., potential impacts so severe as to be incompatible even with minimal continuing human welfare.

In summary, a minimally prudent (risk-averse) judgment should assume that the remaining global carbon budget for +2ºC may in fact prove far smaller than stated above, meaning that precautionary action should be undertaken even more deeply and urgently. “Tolerable” adaptation may not be possible unless effective mitigation occurs; therefore mitigation must be the immediate climate policy priority in all nations, but especially those with high per capita emissions and/or historic responsibility. Typically climate policy is not in line with this precautionary thinking even though precautionary actions in other areas such as health and security are taken even with far less likely risks of high impacts. Even a 1% chance of human-caused, planetary, catastrophic or near-catastrophic climate impacts would indicate that immediate, extremely deep mitigation action should be taken “at all costs”.

The recent NESC-Secretariat’s report on climate change policy[11] mentions global climate risk, but for Ireland it concentrated on local extreme weather events (that have still increased in frequency due to climate change by about 20%[12]) and possible slower climate change compared to other countries. However, it entirely failed to spell out that the most likely imminent climate risks for Ireland are indirect due to probable global systemic breakdowns. Food price increases and water shortages, due to extreme weather elsewhere, are likely to impact on food, energy costs and trade for Ireland as a result of continued high global emissions. Ireland will also need to plan for continual and possibly accelerating sea level rise from now on. Ongoing humanitarian emergencies, widespread conflict, and significant population displacement are all also already beginning to become serious proximate threats.

The NESC-Secretariat’s and DECLG’s wish to move “beyond a compliance-centric approach” has the appearance of a lazy device simply to avoid engaging with any hard physical realities, even those as weak as current EU targets (that would still fall significantly short of climate policy that was realistically aligned to the +2ºC limit). By limiting ambition to avoiding even bare compliance, let alone equitable burden-sharing, that report and derived Departmental policies represent a palpable, if not cynically unethical, attempt to shift responsibility from the primary pollution sectors (fossil fuel emissions in energy, buildings and transport, and methane and nitrous oxide from livestock agriculture) to those less responsible – taxpayers to pay fines for non-compliance in the immediate term, and future generations to suffer the full suite of ultimate climate impacts.

[11] NESC-Secretariat (2013) Ireland and the Climate Change Challenge: Connecting ‘How Much’ with ‘How To’
[12] Allen M (2014) Loading the weather dice. EPA lecture

To quote a senior climate scientist regarding the scientific literature on the risks of a high emissions global future[13]:

there is a widespread view that +4°C is:

– incompatible with an organised global community

– beyond 'adaptation'

– devastating to eco-systems

– highly unlikely to be stable ('tipping points)

… consequently … **+4°C should be avoided at 'all' costs**

(emphasis in original)

3.4 On Equitable Division of the Remaining Global Carbon Budget

The atmospheric capacity with respect to absorbing CO_2 is a global public good for all humanity that is being damaged by GHGs, wherever the source of the emissions. The global political community, Ireland included, has defined a target limit of +2ºC (above which progressively more intolerable "dangerous climate change impacts" must be expected to occur). Climate science has determined that any specific climate target (the probability of exceeding a certain amount of warming) implies a corresponding remaining future carbon budget.

To help guide us toward an understanding of equitable divisions we can make a very rough 'back of the envelope' estimate of an equitable distribution of the carbon budget, both through time and per capita, essentially working out the remaining climate pollution 'rights' associated with +2ºC.

As warming due to human-caused emissions is essentially irreversible on human timescales, emissions rates will have to go to a nett value of zero if warming is to be arrested. This means that the carbon budget of 870 $GtCO_2$ must be divided through time if the rights of future generations are to be respected. At a minimum this budget needs to last for the rest of the century so on average this is about 10 $GtCO_2$ per year.

Given global population estimates, there may be on average 8 to 9 billion people on Earth through this century. Therefore, the average per capita 'allowance' of CO_2 emissions for this century is at most just over 1 tonne of CO_2 per year. Because CO_2 emissions add to the accumulating atmospheric stock of CO_2 causing warming, excess emissions here and now, mean reduced rights for others elsewhere and in the future.

Currently each Irish person is on average responsible for 8.1 tCO_2 per year in terms of direct domestic emissions but this increases to 12 tCO_2 in consumption emissions if imported

[13] Anderson K (2013) Presentation slides

goods are included[14]. Neither of these values includes the large non-CO_2 GHG emissions such as methane and nitrous oxide from Ireland's livestock-dominated agriculture, which add an additional 4 tCO2eq to these totals (albeit, if adopting a consistent consumption basis, much of this might instead be properly allocated to consumers in importing countries; but then the full responsibility for embedded emissions in our own imported goods must be accepted here). Comparing Ireland's per capita emissions with the available global per capita annual carbon budget, clearly the aim of a National Mitigation Plan must be to contract Ireland's total annual net emissions very rapidly toward zero carbon emissions.

Equitable division of the global carbon budget is critically important to the basis of any NMP and yet government to date, including the document produced for this consultation, has almost completely ignored both the global carbon budget and global equity. Authoritative peer-reviewed research on these topics is widely available from the IPCC and in relevant scientific journals. An Taisce hopes that the CCAC will actively seek a role for itself in communicating this science to greatly improve the current level of understanding among the public, in government and in Ireland's media.

Research on dividing the available +2ºC budget between the developed Annex 1 nations and the developing Non-Annex 1 nations[15], in line with burden sharing, shows that **to allow a later emissions peak for the developing countries means that the richer Annex 1 countries must peak immediately and decrease at rates of about 5 to 10% per year.** Even so, developing countries will, collectively, also have to peak emissions very soon, probably by 2025, and decrease emissions at a rapid rate thereafter. Serious carbon budget equity analysis has also been carried out by the Potsdam Institute, SEI[16] and in major journal articles[17]. Ireland's repeated commitment to sustainable development for developing nations (NESC report, DECLG documents etc) is meaningless unless the NMP respects an equitable global carbon budget division. Raupach et al state:

> Any limit on future global warming is associated with a quota on cumulative global CO2 emissions. We translate this global carbon quota to regional and national scales, on a spectrum of sharing principles that extends from continuation of the present distribution of emissions to an equal per-capita distribution of cumulative emissions. A blend of these endpoints emerges as the most viable option. For a carbon quota consistent with a +2 °C warming limit (relative to pre-industrial levels), the necessary long-term mitigation rates are very challenging (typically over 5% per year), both because of strong limits on future emissions from the global carbon quota and also the likely short-term persistence in emissions growth in many regions.

[14] Global Carbon Atlas data for 2013
[15] Anderson K, Bows A (2010) Beyond 'dangerous' climate change: emission scenarios for a new world
[16] SEI Climate Equity Reference Calculator
[17] Raupach et. al. Sharing a quota on cumulative carbon emissions, Nature Climate Change 4, 873–879 (2014)

The SEI Climate Equity Reference Calculator for an example, strong +2ºC pathway (see Figure 3) calculates that **on a full equity basis Ireland would in fact be responsible for 0.3% of global mitigation equating to a notional cut in emissions rates by 2030 of minus 136% compared with 1990 (i.e., a transition to substantial net negative emissions rates within a mere 15 years)**. As with all such calculations assumptions are made, but this example indicates the level of ambition now required if science and equity are to be reflected in any honest way. No version of business-as-usual can possibly meet such ambition: only a whole society focus on rapid and radical mitigation motivated by a hard emissions cap can deliver this level of change. We hope that the CCAC will not shrink from communicating this challenge, and future Government will need to acknowledge this in the actual plan that is politically adopted. Necessarily this will need wide all-party support. If Ireland is to have any credibility with respect to sustainable development these equity concerns will need to be strongly respected.

The Potsdam Institute's paper[18] states:

> Combining findings from climate science and economics with fundamental concepts of equity, the "budget approach" provides concrete figures for the emission allowances that are still available to countries, assuming they want to prevent the destabilization of the planet's climate system. **Our calculations demonstrate that the time pressure for acting is almost overwhelming**—in industrialized countries and also in emerging economies and many developing nations. (emphasis added)

Combining both climate science and equity research, it should be clear that the EU 2050 target range for an 80 to 95% emissions reduction compared to 1990[19] also has to take this knowledge into account. Clearly, given the science-defined need to cut global emissions to zero well before 2100 and the need for equity in doing so, the target for the developed EU, including Ireland, needs to be far closer to an 80% cut as early as 2030 and at least 95% in all emissions by 2050. This is completely at odds with the extremely limited ambition of the Irish National Policy Position (see section 5 of this document).

[18] Messner et al (2010) The budget approach: A framework for a global transformation toward a low-carbon economy

[19] EU Commission Climate Action (2015) Action on Climate

Country/region report in 2030 for Ireland

Hide settings

Global mitigation pathway: 2°C pathway	**Responsibility weight:** 0.5	**Development threshold:** $7,500
Progressive between thresholds: no		
Include land-use emissions: no	**Include non-CO_2 gases:** yes	**Include emiss. embodied in trade:** no
Cumulative since: 1990	**Mitigation cost as % GWP:** 1.0%	**Adaptation cost as % GWP:** 1.0%
Use mitigation smoothing: yes	**Kyoto adjustment:** none	**Emissions elasticity:** 1.0

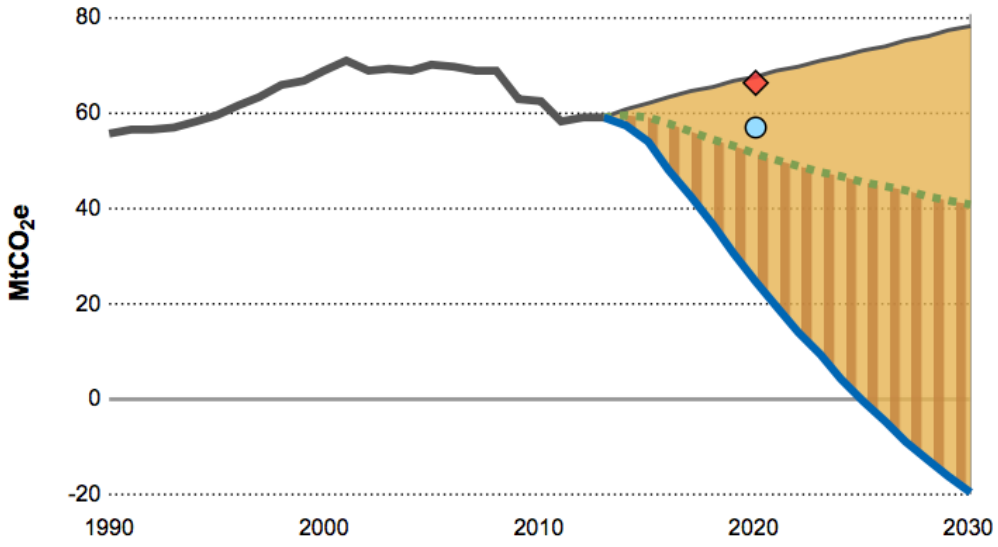


Figure 3: SEI Climate Equity Reference Calculator report for Ireland showing a 2°C mitigation pathway given the shown settings. The main blue line shows the 'fair share' allocation trajectory for Ireland, indicating that Ireland will exhaust its entire fair share of global cumulative emissions from 1990 to 2°C by the year 2025, where the 'fair share' trajectory crosses the zero axis. The thin grey line indicates a 'no policy' baseline derived from the past relation of emissions and economic growth. The dashed green line shows an example domestic emissions pathway for Ireland in line with what the world needs to achieve. In equity terms Ireland would need to transfer funds to developing countries to justify emissions above its 'fair share'.

Achieving any climate target requires burden sharing – according to responsibility and capacity. The differentiated and unequal responsibility for historic and current emissions between richer and poorer nations globally, within the EU, within Irish society and between sectors means that **Ireland's NMP must identify alternatives for just and fair burden sharing in the transition to a zero carbon future.** However determined, climate justice, as well as physical reality, constrains the division of the global carbon budget. This can only mean that Ireland, with high current emissions, substantial historical emissions, and high GDP per capita, can only rightfully expect to claim a rapidly declining share of the global budget. Any excess emissions beyond this quota will need to be paid for, and any mechanisms allowing excess by transfers to poorer countries must ensure that the excess emissions are never emitted.



Figure 4: For long term sustainability the global economy is entirely reliant on global environmental health and the health of human society. Climate change and over-use of resources are undermining both of these critical supports to economic prosperity.

3.5 Climate Economics: "Efficiency" is Inadequate, Emission Caps Required

Politically, Ireland and most of the developed world continues to stress short-term economic risk over long-term climate impact risk. This is economically foolish. It exposes all economies to ever increasing climate risk through continuing to build infrastructure and plan policies that commit to very large future GHG emissions. These will, as climate science and risk analysis clearly show, inevitably cause increasing economic damage by undermining the Earth systems that support the global economy.

Government documents, including the NESC-Secretariat report on climate change and the present DECLG discussion document, continue to stress short-term economic "feasibility" and "cost-effectiveness", as the primary, if not the only, determining factor in climate policy. But we must remember that the Earth's climate system does not 'care' about these human preferences, it simply traps additional reflected solar energy as more greenhouse gases accumulate. **Economic 'feasibility' depends entirely on the time frame on which the judgment is made:** long-term global economics in a general equilibrium frame stressing sustainability is entirely different from partial equilibrium framing stressing short-term and national preferences. Only the former is valid for a global public good, and on this basis the local view may well be uneconomic and create greater damage, undermining the sustainability of critical supports for the global economy, and for food production, health and security.

Even at the national and local level, climate policy must be driven by global considerations, not national and local ones. This is the economics of preserving a global public good like climate stability or peace. As in avoiding a nuclear war – by not launching the missiles – even local leaders must work to achieve the global and long-term result. If we continue to look at climate policy in terms of 'economic' choices made on

national and short-term factors, long-term and global failure is assured. If our national and local efforts are to realise a road to restabilising our planet's climate system, we have to 'Think Globally, and Act Globally'[20].

A key point, continually overlooked by policy makers and advisors, is that it is the total cumulative CO_2 that equates to the resultant level of irreversible warming[21]. Even if a climate policy achieves decreasing annual CO_2 emissions the stock in the atmosphere still increases with each year's addition, so that only when, and if, CO_2 emissions fall to zero will the resultant warming finally slow, and global temperatures eventually stablise (though the latter will happen only after a further multi-decadal lag time). This means that at some stage, soon after 2050 according to IPCC WG3 scenarios based on the +2ºC carbon budget, the entire human energy system will have to be zero carbon and other systems including agriculture will need to be very low carbon-equivalent from then on. All such pathways require action to start now to avoid requiring completely unachievable or impossible rates of decarbonisation in the near future.

Many economists like to stress improved 'efficiency' in energy use or decreases in carbon intensity as primary methods of 'saving emissions'. To date this claim is demonstrably false: the global economy and all developed economies have shown massive gains in efficiency and yet no sustained cut in total annual emissions has ever been achieved. Total emissions have risen inexorably and for CO_2, raising levels remaining in the atmosphere, that will remain so for thousands of years. The real question that has to be answered by efficiency policies is: After making these 'savings', how are they spent or invested? To date they have been, and continue to be, reinvested in a fossil-fuel based economy negating the saving and, historically, contributing to ever higher annual global emissions.

The claim that efficiency can be a primary lever of climate policy without imposing +2ºC carbon-budgeted, deep decarbonisation pathway ignores the essential facts of fossil fuel economics, climate science (global and very long-term), and the historic feedback between energy and growth in material consumption. By concentrating on the partial equilibrium economics of short-term and sub-global analysis there has been a widespread failure to achieve global and long-term cuts in emissions. As Lord Stern famously summarized, climate change represents "the greatest market failure that the world has seen"[22].

Essentially, on a global and long-term basis, economic growth has been driven by cheap fossil fuel energy. Efficiency gains then enable expansion of the economy by investment in improved technology, both of which increase supply and demand for ever more energy, increasing material consumption. Unfortunately, it turns out that the fossil fuel basis of most of this energy means that this same economic societal expansion causes a growing

[20] Wiener J (2007) THINK GLOBALLY, ACT GLOBALLY: THE LIMITS OF LOCAL CLIMATE POLICIES
[21] IPCC (2013) AR5 WG1 SPM p.27
[22] Stern: Climate change a 'market failure', The Guardian, 29th Nov 2007

pollutant flow of CO_2 adding to a cumulative stock of emissions in the atmosphere and the ocean. This growing stock will increasingly undermine economic growth unless it is stopped.

Jarvis et al (2013) detail this historical feedback pattern and thereby show the massive shortfall in climate policy to date[23]. Global energy use has increased steadily by 2.4% per year (exponential growth, doubling every 30 years). Total global carbon emissions have increased steadily by 1.8% per year (again exponential growth, doubling every 40 years). Therefore the improvement in efficiency has seen an average drop in carbon intensity of only minus 0.6% per year. Effectively then, on a global and long-term basis, the annual 'rebound effect' in energy use is about 102.4% and in carbon emissions about 101.8%. This reality is far in excess of estimates made on partial assessments of rebound made by the IEA and SEAI for example.

Jarvis et al show that the global economic response to climate change needs to achieve far greater decreases in carbon intensity of minus 13% per year, 26 times faster than historically. **In terms of responding to global temperature increase, Jarvis et al conclude that climate policy response needs to be 50 times faster than it has been since 1990.** Quantum leaps in climate policy ambition are required for any +2ºC pathway for the world, and for Ireland's just part in the world.

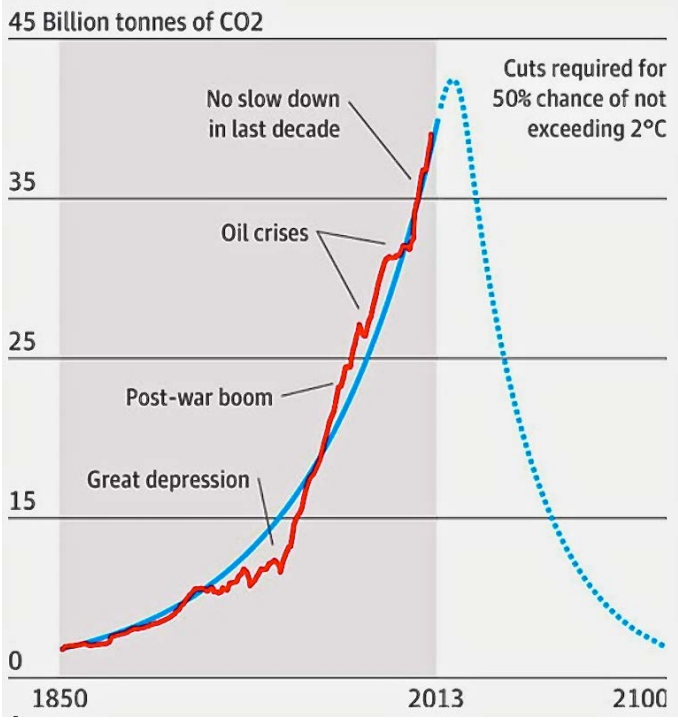


Figure 5: Global emissions to date have followed an exponential growth curve of 1.8% per year (total emissions doubling every 40 years). Dashed line shows cuts required for only a 50% chance of not exceeding +2ºC. Chart by The Guardian, base data from Jarvis et al (see footnote on previous page).

[23] Jarvis et al (2012) Climate-society feedbacks and the avoidance of dangerous climate change. Nature Climate Change.

The only way to drive such a massive increase in policy response is to take seriously the need to constrain the combined Mitigation Plans of the world within a +2ºC carbon budget. For richer countries like Ireland the NMP is further constrained by climate justice. A realistic climate budget target for the NMP would push business and society to innovate at far greater speed and to deliver far more energy efficiency and low carbon energy by removing subsidies from the fossil fuel industry and high carbon agriculture, and investing now in a rapid low carbon transition for energy, transport, land use and buildings.

There can be no doubt that this speed and scale of change is needed. The only real question is, why is government unable to acknowledge this in the National Policy Position and commit to an equitable carbon budget for the NPP?

Global trade flows take no account of embodied carbon so emissions continue to be driven by consumption thereby creating a demand for high carbon energy and food. Science is clearly saying that a very large amount of the peat, coal, oil and gas already in known reserves must stay in the ground[24]. Livestock agriculture also produces a very large, and increasing ongoing flow of GHGs that must be limited globally for any chance of limiting warming to +2ºC[25].

The simplest and most economically logical answer is to tax all these at source so that the polluter pays; ultimately this is the consumer but it is simpler and more logical to tax 'upstream' at the source – the wellhead or mine or peatland for fossil fuels, and at the farm per animal for livestock – so that the increased price is made internal to the market and passed downward to consumers. Any such pricing regime inevitably requires redistribution of carbon tax revenues to avoid increasing inequality and to invest in avoiding emissions.

[24] McGlade C, Ekins P (2015) The geographical distribution of fossil fuels unused when limiting global warming to 2ºC. Nature.

[25] Ripple et al (2014) Ruminants, climate change and climate policy. Nature Climate Change

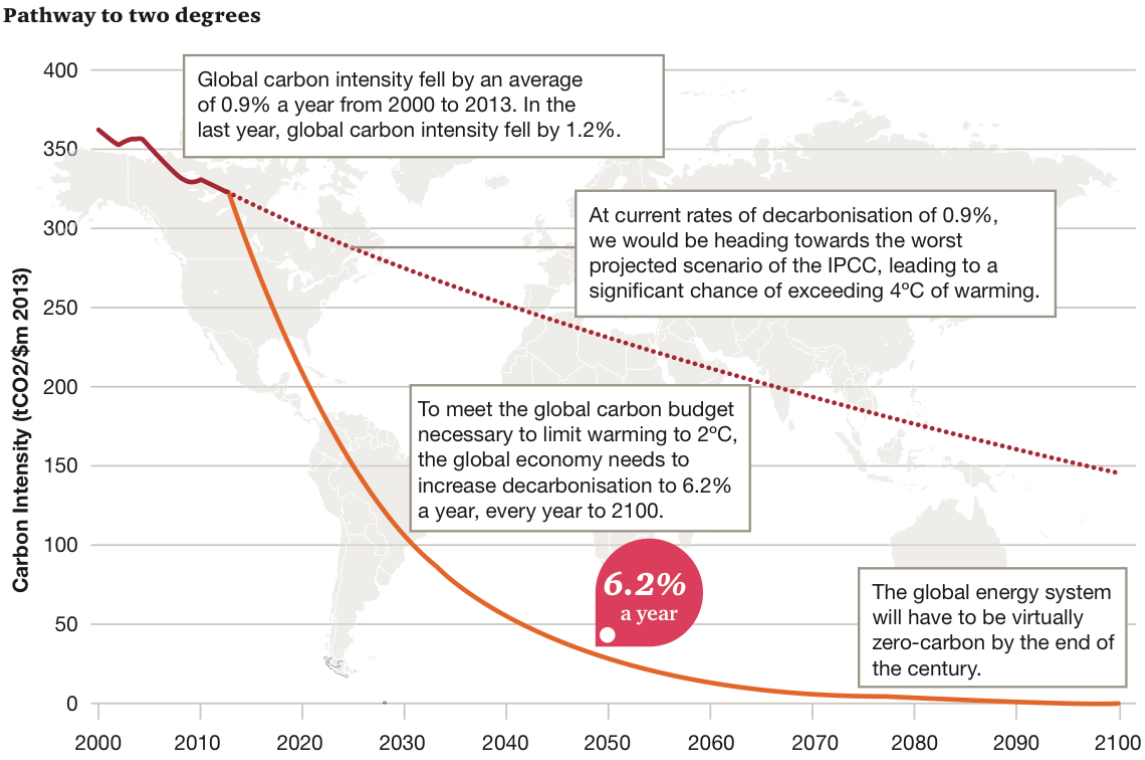


Figure 6: Average global carbon intensity reduction rates for a pathway to two degrees.[26] In fact, global carbon intensity (emissions per unit GDP) has essentially halted since 2000 due to increasing use of coal. Continuing use of coal, peat and other fossil fuels is making 2ºC less achievable. ***(From Two degrees of separation: ambition and reality, Low Carbon Economy Index 2014, Price Waterhouse Cooper, p.3)***

Emissions trading schemes or taxes on trade are far more difficult and more easily undermined than regulation and pricing, especially if they are set up with free credits to polluters and are at odds with a +2ºC carbon budget. This is the case with the EU ETS which has been severely compromised by a low carbon price of less than €10 per tCO_2 compared with a far more realistic price of $100 (c. €91) per tCO_2 based on Integrated Assessment Modelling[27].

According to the World Bank, agriculture's 'value added' is only 1.6% of Ireland's GDP[28] yet it is produces over 40% of Ireland's Non-ETS emissions of GHG pollution. These emissions could (and should) be paid for by the consumers of beef and dairy products, who are mostly in other countries, by levying a tax on agricultural emissions at source (ideally on a global basis, but certainly across the EU). A tax per head of cattle, on a basis of €19 per tCO2eq has been suggested as appropriate by EU researchers[29]; Teagasc's marginal abatement cost curve of efficient emissions reduction in agriculture assumes a carbon tax[30]; and the Department of Finance agrees that the polluter should pay.

[26] Price Waterhouse (2014) Two degrees of separation: ambition and reality, Low Carbon Economy Index 2014, p.3
[27] Hope C (2013) Critical issues for the calculation of the social cost of CO2 Climatic Change
[28] World Bank (2015) Agriculture, value added (% of GDP)
[29] EUROPEAN COMMISSION STAFF WORKING DOCUMENT p.58
[30] Teagasc (2012) A Marginal Abatement Cost Curve for Irish Agriculture p.29

Illogically, the Department of Agriculture and the National Policy Position fail to follow through with climate policy that prices agricultural emissions, to achieve Ireland's non-ETS target or in future within an international trading scheme aligned with +2ºC. This would be the economically efficient way to raise revenues to fund a low carbon transition for farmers but it appears that political failure to resist vested interests within the agri-products sector continues to obstruct a transition to climate-smart agriculture, especially for small farmers.

A common misconception in government and business thinking is that 'sustainability' equates to sustaining profits in line with existing practices: it does not. Sustainability must look to the very long term and global. If existing practices undermine these goals they are not sustainable options or part of a sustainable economy.

Any discussion of sectoral plan options is only possible if an equity-related +2ºC carbon budget cap on future NMP emissions has been outlined (even if it is not immediately operational). Otherwise any plan adopted is very likely to amount to continued wishful thinking, promoting short-term 'growth' that is in fact completely uneconomic in the long term. Sustainability within a +2ºC carbon budget requires a strong focus on very long-term climate stability, such that avoiding carbon emissions becomes core to all economic policy. Otherwise our policies will continue to be based on adding to climate damage and so undermining the future of the global economy and the systemic stability of global society.

3.6 Societal and Institutional Innovation to Deliver Mitigation Action

The level of societal, institutional and political change required to deliver the level of response now needed to cut emissions quickly is already daunting. Unfortunately delay makes the changes required ever larger and ever more difficult to discuss. It is unsurprising that both the public and politicians do not want to acknowledge this, and media do not want to deliver this information in any consistent way despite rising risk. However, this deep level of individual and societal denial bolstered by the inertia of business-as-usual preferences is ever more dangerous. At this stage gaining some grasp of the situation amounts to a moral and civic duty.

The current path of business-as-usual total emissions is a recipe for ultimate despair; a more hopeful climate action pathway requires the adoption of very different approaches. While economic booms and busts occur, emissions continue to add to global warming and climate change yet Irish Governments have failed to increase climate awareness among the public. A €15 million promise to deliver a Climate Awareness campaign from 2008 onward[31] was never delivered and the present Government has similarly failed to deliver.

Ireland's 2020 target has been consistently described by politicians as 'challenging' and the result has been that no serious measures actually resulting in long-term cuts in total emissions has been achieved: transport emissions are now rising quickly, there is no plan to cut agricultural emissions, and even energy emissions are forecast to rise. Cuts in emissions

[31] Government of Ireland (2007) National Climate Change Strategy 2007–2012, p.27.

due to electrical generation, heating buildings and industry have been made but the ESB are committed to continued coal and peat burning and government investment in building energy efficiency has fallen.

Critically, no Cabinet decision on Irish sectoral burden-sharing to achieve the EU target of a 20% cut in non-traded (Non-ETS) emissions has been made by this or the previous Government. No business, faced with such a target, would behave in such an irresponsible manner. Given such leaderless decision-making, An Taisce has noted that all of the sectors including transport and agriculture have an implied minus 20% target for 2020 unless a decision is actually made otherwise by Cabinet. This political inaction explains the failure of climate policy to achieve actual reductions in total sectoral emissions, especially in agriculture and transport. For more, see An Taisce's challenge to the Departments of Transport and Agriculture to achieve the implied 2020 targets or else for the Cabinet to spell out exactly what the sectoral targets actually are.[32]

What outline of climate policy makes sense? Again research provides answers that continue to be ignored. An Taisce presumes that independent CCAC assessment and robust reporting from it will push government to take more notice. Emission budget analysis of global emissions shows that for fossil fuel CO_2 there is now not enough time to reduce emissions rapidly enough by changing to renewables alone (even if that were immediately technically feasible). Very large energy demand reduction is also required (see Figure 7 below). Such large near-term demand reductions imply that economic growth could well be impacted, destabilising the growth-reliant economic model of recent decades.

Highly regarded research in business literature[33] and climate policy[34] show that setting 'top down' stretch targets (like a +2ºC aligned carbon budget), but supporting 'bottom up' innovation in institutional, technical and behavioural change, is by far the best approach to enabling rapid change. The worst approach is to avoid setting targets and adopting national, essentially top-down 'change programs'. To date Ireland is following the latter course.

Local frustration with such failures can result in highly innovative and step changes in mitigation action. California's insistence on energy generation and transport emission standards and caps has driven change at national level in the USA. Neil McCabe's radical emission reduction and sustainability actions at one north Dublin fire station are now transforming the entire Dublin Fire Brigade[35] as well as inspiring policy change throughout Dublin City Council and internationally[36]. Dun Laoghaire Rathdown's inclusion of improved building regulations in 2004 and now Passive House ambition in their County Development

[32] An Taisce Challenges Transport and Agriculture to actually achieve their agreed 2020 Climate Targets
[33] Schaffer RH, Thomson HA (1992) Successful Change Programs Begin with Results. Harvard Business Review.
[34] IPCC AR5 WG3 Ch.15 National and Sub-National Policies and Institutions, see sub-section 15.2.5 and 15.8
[35] Citizen Action Monitor (2015) Neil McCabe's Green Plan presentation wins high praise at Radical Emission Reduction Conference
[36] EU Sustainable Energy Week (2015) Carbon Neutral Fire Fighters Station

Plans has produced reactions at national level. These local innovations are a direct result of 'Thinking Globally and Acting Globally'.

By adopting a +2ºC aligned NMP, Ireland and the EU could drive global change to do the same. In the meantime, ad hoc arrangements among the twenty highest emitters including the EU could achieve the same result if they can enforce the long-term +2ºC carbon budget aligned with equity. However, the associated wealth transfers to achieve equity will require major changes in international institutions and much increased support from wealthier regions and nations for both institutions and developing nations.

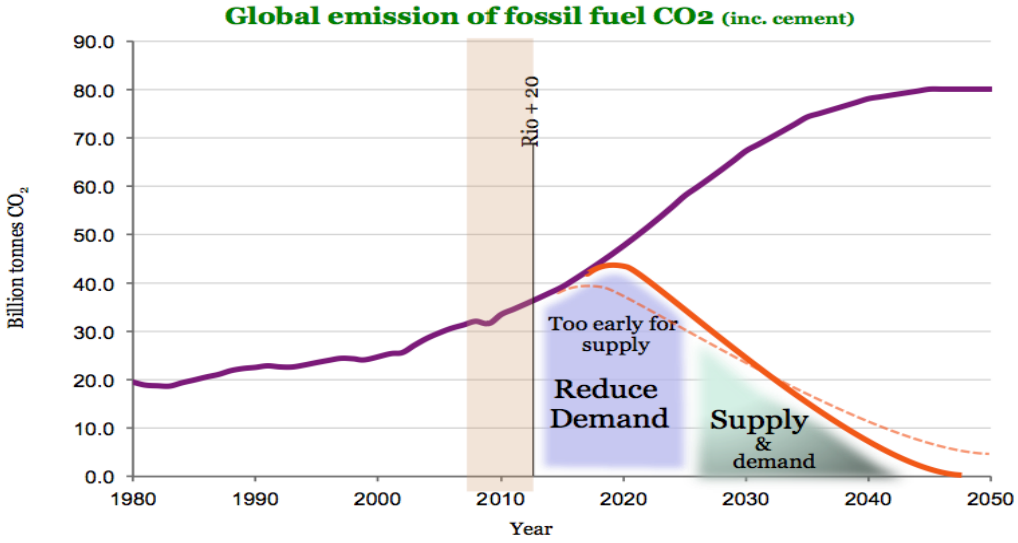


Figure 7: Global Emission pathways. +2ºC in red, +4ºC high emissions in purple. Demand will need to be cut quickly because there is not enough time to build low carbon (renewable or nuclear) energy to replace fossil fuel energy infrastructure and enable a supply side only transition. This Figure shows global average pathways, much faster transitions and so much greater demand-side reductions are needed in high-emissions-per-capita nations.[37]

The Lancet Commission's recent major report on health and climate change has found that continuing business-as-usual (Ireland's current path) presents increasing and potentially catastrophic effects on human health. Conversely, they find that climate action has immediate co-benefits that increase human health as well as greatly reducing potential suffering due to climate change[38].

Any realistic vision of societal change as a result of climate change policy response will need to prioritise equitable outcomes in society to ensure societal cohesion, well-being and security. A policy focus on increased well-being, in measures such as life expectancy and happiness rather than just GDP, would appear strongly advisable in guiding mitigation pathway decision-making. Some nations are already achieving this kind of policy combining society-wide high life expectancy and improved health outcomes with low carbon emissions[39].

[37] Anderson K (2015) Presentation slides.
[38] The Lancet Commission (2015) Health and climate change: policy responses to protect public health
[39] Lamb et al (2014) Transitions in pathways of human development and carbon emissions, Environmental Research Letters.

4 Analysis of Ireland's EPA Emission Projections

The 2015 EPA Emissions Projections document provides historic emissions up to 2013, and projected emissions up to 2035 (based on current policy and economic modelling). Ireland may in fact only miss the cumulative 2013-2020 target emissions by a small amount, because the economic crisis meant that emissions were low at the start of the period. However, instead of heading downward over the period up to 2020, in line with EU policy intent (and climate change necessity), emissions are actually forecast to rise over the period with economic growth. Government policy has failed to decouple emissions from growth such that emissions are forecast to rise up to and even after 2020, and right through to 2035. The EPA state[40]:

> Overall it is evident, based on this analysis, that Ireland is not on track towards decarbonising the economy in the long term in line with the Climate Action and Low Carbon Development Bill 2015 and will face steep challenges post-2020 unless further polices and measures are put in place over and above those envisaged between now and 2020. (p. 14)

At present, Government policy is to pay the compliance penalties for breaching the targets when and if they become due. In other words, allowing the taxpayer to pay for excess emissions that the agriculture and transport sectors in particular have caused. The polluter is not paying the full external costs due to climate. The costs to Revenue could be considerable as government research already shows[41].

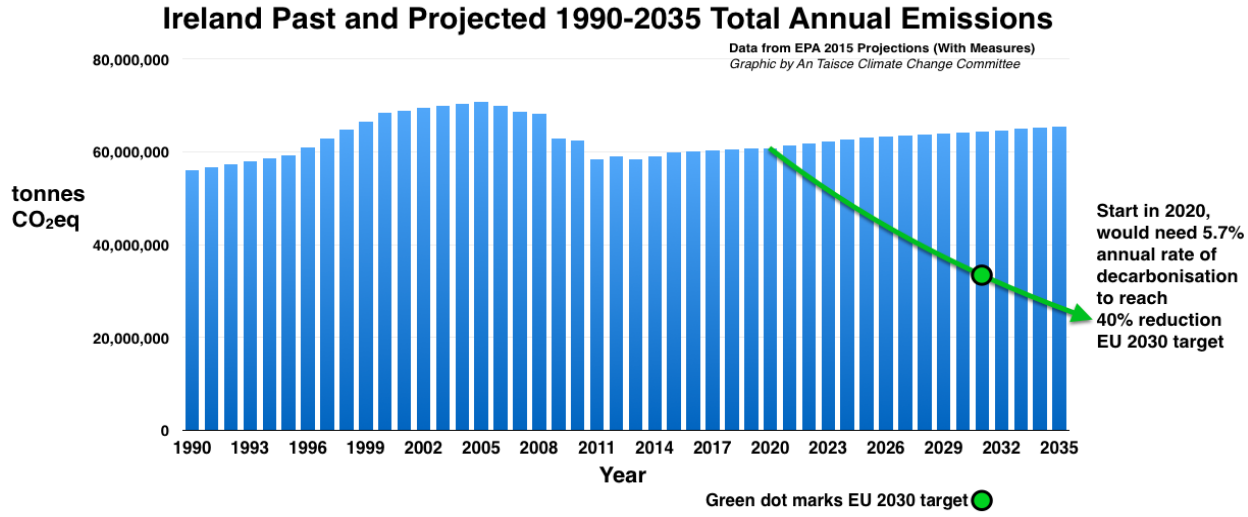


Figure 8: Ireland Past and Projected Total Emissions 1990-2035 with EU 2030 target shown

Figure 8, using the EPA ('With Measures') data, shows blue bars for Ireland's past and projected emissions. Also shown is the EU 2030 overall average reduction target of 40% less emissions relative to 1990. If policy changed right now to taxing all emissions, investment in cutting emissions and ensuring equitable burden-sharing according to wealth

[40] EPA (2015) Ireland's Greenhouse Gas Emission Projections 2014-2035

[41] DPER (2014) Future Expenditure Risks associated with Climate Change/Climate Finance

and income, then meeting the target would become possible and economically sensible. If Ireland started from the EPA projection for 2020 then a decrease of 5.7% per year would be needed for Ireland to achieve such a target. It may be that Ireland manages to negotiate a lesser target, based on its failure to control transport and agricultural emissions but such special pleading is an effort to evade responsibility rather than achieve emission cuts. Because of the fixed global carbon budget it essentially expects some other nation and some other citizens to emit less to compensate for our extravagance.

It would be good policy, being both less expensive and more technically feasible, to begin early and decrease emissions steadily over a longer time. However, the EPA figures based on current policy show that this is not anticipated under the 'With Measures' scenario. This scenario is supposedly a 'worst case' but it currently seems unlikely that much better will be delivered by 2020 and the actual outcome may well be worse. The 'With Additional Measures' scenario is wishful thinking at this stage because investments were not made and agriculture and transport have indicated that they will achieve nothing in cutting total emissions.

As the An Taisce figure below shows, delaying action until after 2035 will make hitting an 80% reduction target almost impossible, yet this is a projected outcome of Government policy in light of EPA projections.

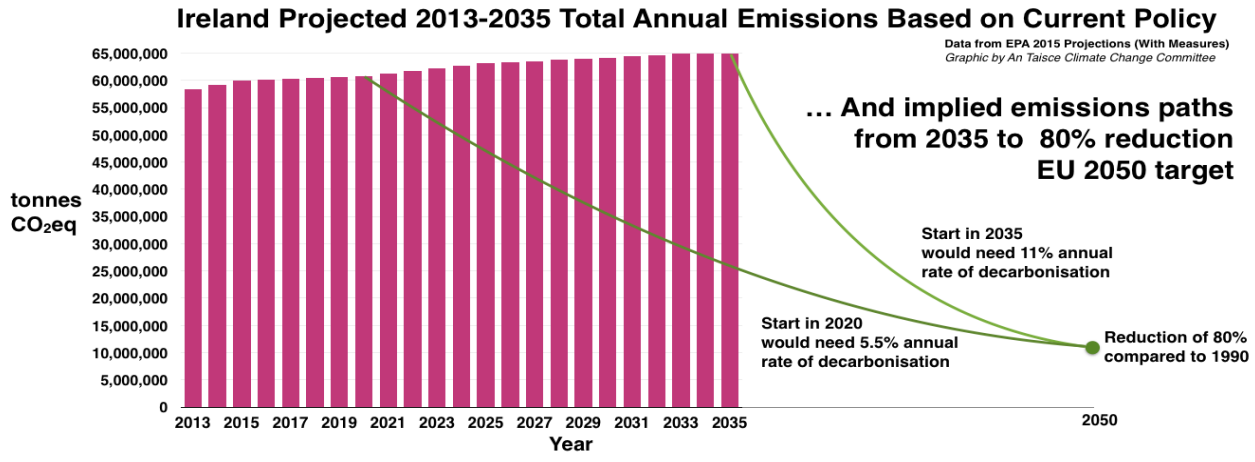


Figure 9: Ireland Projected 20-2035 Annual Emissions and Reductions Paths to minus 80% by 2050 Target

By not making this reality clear in the NPP, government is potentially committing future Governments to completely impossible rates of decarbonisation while irresponsibly failing to achieve the safer course in the long-term national interest.

If this is allowed to occur then future governments will presumably blame current ones, in the time-honoured way. It is the most vulnerable and exposed in our society and elsewhere that will suffer from climate damages first, but eventually the logic of cumulative climate damage on a high emissions pathway is that everyone, even the richest, will suffer. Research (as assessed by IPCC WG3) makes it very clear that achieving a safe course may seem difficult now but acting urgently and deeply, starting now, will be far less painful enabling the most just outcome overall for current and future generations.

5 Analysis of the National Policy Position

5.1 Outline of the National Policy Position

The Climate Action and Low-Carbon Development National Policy Position, or NPP, is official Government policy. To quote clarification received from DECLG[42]:

> The ambition as expressed in the NPP is sectoral in nature and not an economy wide target. Furthermore it is a point in time objective so cannot be converted into a cap on emissions (even in those sectors) at any intermediate point between now and 2050.

Regarding the rate of change DECLG says:

> The Department has not prepared calculations based on an even [fixed] per cent per year however one could calculate such rates of change from publicly available sources (i.e. using the EPA inventories and projections publications).

In this section, An Taisce attempts a preliminary analysis as suggested by DECLG and would welcome any corrections or alternative analysis from government or others.

The NPP is essentially split into two parts, first:

> an aggregate reduction in carbon dioxide (CO_2) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors

and second:

> in parallel, an approach to carbon neutrality in the agriculture and land-use sector, including forestry, which does not compromise capacity for sustainable food production.

No reason is given in the NPP for according the agricultural sector special treatment in emissions policy, nor for dedicating carbon sequestration from forestry solely to offsetting emissions from agriculture. Nor is any definition provided of how close the 'approach to carbon neutrality' will actually come to zero net emissions from agriculture and land-use by 2050.

[42] DECLG (2015) email communication.

5.2 Analysis of the National Policy Position

For the first NPP sectoral group, of electricity generation, built environment and transport sectors (abbreviated below as EBT) our analysis indicates that already, as of 2015, achieving the NPP's target for the EBT sector would require annual emission decreases of 4.7% year on year up to 2050.

However, the EPA projects, based on current policies, that this EBT collection of sectors will increase emissions by 20% up to 2035 with increases in transport and energy. If that occurred then emission reductions of 9% per year would be needed to achieve the NPP target if a new peak is delayed until 2035 as per the projections.

Meanwhile agriculture gets, in effect, a "free ride". The EPA projection to 2035 indicates that agriculture emissions will rise by a few percent and Teagasc forecast that no emissions reductions will be achieved by agriculture even up to 2050 (see Figure 10). Agriculture in Ireland is dominated by cattle production for beef and dairy causing very large GHG emissions. The carbon intensity of dairy cattle has increased due to more methane and more fertilizer per head as production has increased. Government are attempting to claim that livestock agriculture is important for global food security (it is not), that its emissions can be offset by forestry (these offsets are also needed by other sectors), and carbon leakage of production to less efficient producers is likely (not a valid argument unless Irish production is brought within a capped emission +2ºC aligned system so that efficiencies can be realised).

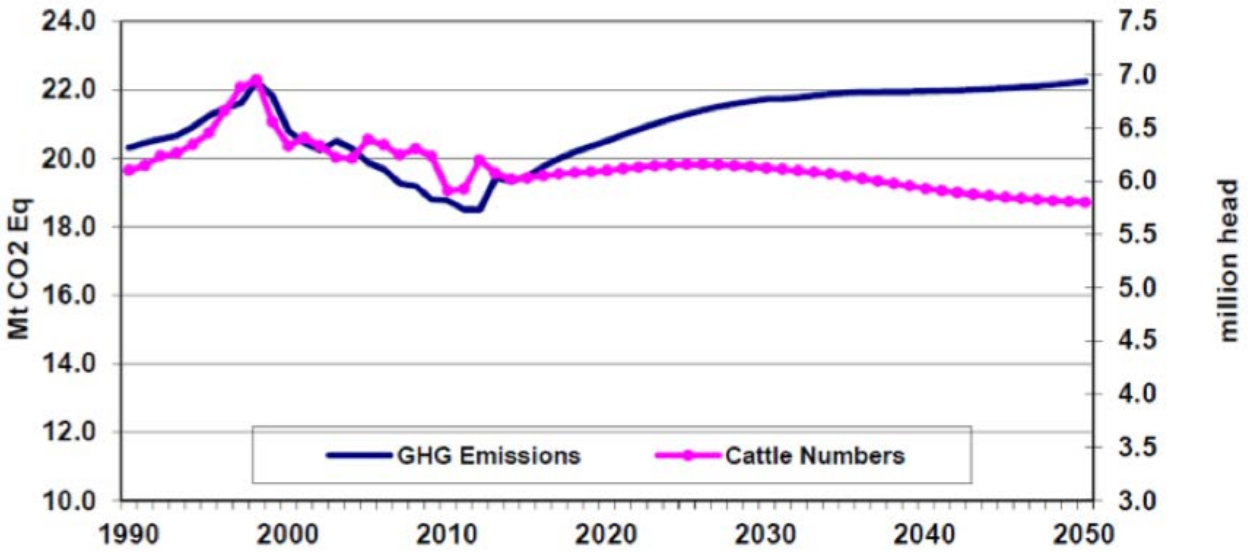


Figure 3.2: Projected agricultural GHG emissions and total cattle numbers under the reference scenario. Source: Donnellan et al. *(2013).*

Figure 10: Teagasc figure showing that agricultural emissions are not forecast to decrease at all before 2050. How is this a path to carbon neutral agriculture in Ireland?[43]

[43] DAFM (2015) Discussion document on potential GHG mitigation within the Agriculture and Forestry sector, p. 60

DAFM (see footnote 43 above) state:

> 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. The principal divers for the increase in emissions in the short to medium term are the growing population of dairy cows, pigs and poultry and associated increases in fertiliser emissions and emissions associated with animal waste. This overall growth in emissions would be only partially offset by a decline in the number of suckler cows. (p.60)

In other words, the Department of Agriculture's discussion document on potential GHG mitigation within the Agriculture and Forestry sector plans to deliver no mitigation at all. In fact emissions will increase. Under Food Wise 2025, even suckler cows will not decrease, raising emissions still further. For climate policy, Food Wise 2025 is extremely unwise.

Mitigation options in ruminants (cattle and sheep) are severely limited so the only possibility for substantial emissions decrease is a cut in animal numbers. This policy option has been rejected without any substantive societal discussion as to how this refusal to countenance cuts in agricultural emissions affects the carbon budget of the National Mitigation Plan.

Our analysis suggests that if agriculture is allowed to continue with zero mitigation (or in fact increased emissions as projected under current policy), and the EPA projected emissions occur in all sectors to 2035, then the EBT sector will have to be zero carbon by 2050 (meaning no emissions at all from energy, buildings or transport) to achieve an overall cut of 80% in total EBT emissions by 2050.

This is clearly unfeasible. If the EPA 2035 projection for EBT occurred (a 20% increase relative to current EBT emissions) then there would be almost no carbon budget left for EBT after 2035 to meet the EU 2050 target. Even on its own terms then (falling far short of a +2ºC outcome) the NPP makes no sense in regard to the 2050 EU target or in regard to achievability – unless rapid, sustained action starts now.

An Taisce are interested to know if this is an outlook accepted or planned for within the Departments of Energy and Transport.

The disparity between agriculture and other sectors appears to be purely a political decision favouring food producers and the largest farmers. Ireland's livestock agriculture cannot contribute to climate mitigation unless it is part of an enforced cap on emissions. In theory it already is within such a cap as part of Ireland's legally binding Non-ETS emissions sector cap and will be again up to 2030. However, the current plan is that the polluters, the consumers of high GHG agricultural products will not pay; the plan is instead that general taxpayers will, reducing spending on other services.

5.3 Meaningless "End Date" Targets: A defined carbon budget and pathway are needed

Even ignoring the unjustified separation of agriculture from other sectors, looking at the NPP's basis of limiting climate emissions according to an end-date is entirely at odds with climate policy logic, which, in the specific case of CO_2, demands cuts in cumulative emissions. Cumulative total emissions are simply calculated by adding together the annual emissions values for every year of the period. Visually, the cumulative total emission is the same as the area under the Emission Path.

In the figure below, the left hand chart shows a "No Policy" emission path where the annual emissions stay the same in every year as they were for the first year of the period. In the No Policy path and for Emission Paths 1 and 2 the area below the paths, equivalent to the cumulative total emissions is shaded. As shown, the "No policy" case gives a good basis of comparison for "Policy" pathways, so they can be compared in terms of cumulative emissions: the areas under the emission paths.

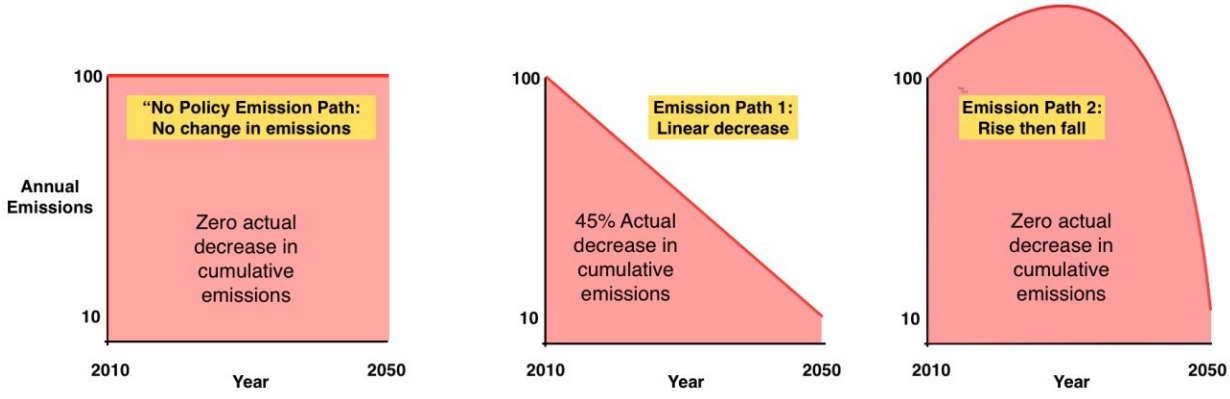


Figure 11: Flatlining emissions (left) compared against two emission paths with the same end-date 'target' but very different cumulative emissions outcomes. Red lines show emissions paths. Area under emission path is equivalent to the total cumulative emissions. End-date targets are therefore meaningless unless they state cumulative emissions.

Even at a glance it is obvious that in terms of cumulative emissions these three alternatives present very different climate outcomes with profound implications for climate policy statements and targets.

For the left hand scenario of 'flat-lining' emissions (a policy professed by the Departments of Agriculture and Transport) emissions may not increase but the same amount of emissions are added to the excess accumulation in the atmosphere, ocean and land each year. In the example – with 100 units per year of emissions over the 40 years from 2010 to 2050 – 4000 units are emitted.

For Emission Path 1 compared with "No Change Policy" it is clear that the claimed "90% reduction in emissions" is true only in comparing the end year against the start year annual emissions. But from climate science we now know that only cumulative CO_2 emissions matter for any climate policy informed by reality. In fact, the real decrease that can be claimed for this linearly decreasing pathway to the target is not 90% but only a 45% reduction in cumulative emissions (to 2200 units emitted in all).

Much worse though is Emission Path 2. Again it is true that the claimed "90% reduction in emissions" occurs by comparing the end year against the start year annual emissions. However, visually it is obvious that the area under the curve is much the same as for "No Policy", so despite apparently achieving a "90% reduction in emissions" the actual policy-relevant cumulative emissions 'achievement' is of no benefit at all. Note also that in the entirely likely event that the end period steep annual emissions decline was not to be achieved, and the target is missed, then the cumulative emissions would be higher than the No Policy case. The EPA in particular should be pointing out this fact to the public and to government.

Any serious climate policy means declining emissions steadily year on year with as steep an emissions path as is necessary in light of climate reality. This would be a set percent decrease per year equating to large absolute decreases in early years (cutting the 'low hanging fruit' of emissions savings first) and smaller ones later. The only way of achieving such a pathway is for all political actors to agree to publicly state the emissions path and the associated cumulative emissions that need to be followed. Any year in which annual emissions exceed the budgeted emissions for that year will have to be made up by lower than budgeted emissions in succeeding years (i.e., an even higher rate of reduction for all later years).

Variations in annual emissions are bound to occur but a meaningful climate policy would strictly enforce the national carbon budget over time and monitor the pathway – to penalise sectors with excess annual emissions and reward sectors with low emissions. Taxation could be based on climate 'bads' rather than on income so that the economy diverts sharply from the current high GHG path. This overall policy approach for the NMP is not only the safest but also the surest in giving certainty to the economy: inspiring innovation in the right direction for future resilience to climate shocks from both climate damage and global policy.

5.4 NPP Conclusion: Economy-wide and cumulative targets are needed

Contrary to DECLG statements and documents, an economy-wide target with a repeated percent per year decrease in total annual emissions, within a +2ºC aligned and carbon-budgeted National Mitigation Plan is exactly what is required of a National Policy Position. A sectorally-biased plan, with an inbuilt political bias, and end-date targets that do not specify a cumulative emissions target or emissions pathway are not acceptable even as "adequate", never mind "ambitious", climate policy.

An Taisce strongly encourages the CCAC to independently assess the National Policy Position in regard to its cumulative carbon budget and its overall economy-wide ambition relative to a +2ºC and equity-aligned carbon budget. Separately, the CCAC will hopefully develop alternative policy-choice emission pathway options for decision by Government and cross-party debate to enable wide support for a long-term pathway within a +2ºC carbon budget.

An Taisce's view is that the current NPP is fundamentally unfit for purpose as it is completely lacking in any ambition commensurate with the reality of acting in line with +2ºC or in regard to equity. It unfairly and willfully (despite the science of +2ºC) treats Ireland's high GHG ruminant-based agriculture as essentially "untouchable". It does not define what "an approach to carbon neutrality" for agriculture even means. And, for the EBT sector, the end-date target is meaningless in isolation as it lacks a cumulative carbon budget or specified pathway. A whole economy approach is critical to making rational, evidence-based decisions regarding pathway options.

An Taisce's preliminary analysis of the EPA Projections and comparison with the NPP shows that Ireland's current climate policy is wholly inadequate both in achieving and planning for emission reductions. We hope that an independent and evidence-based assessment of an outline NMP and transition pathway options by the CCAC can assist government and Departments to escape the path-dependency, vested interest bias and groupthink that seem frighteningly evident. At present the NPP appears to be a device contrived to distract from the reality of political inaction. Avoiding and delaying critical mitigation decisions is not a path that helps address climate change. In fact they increase the challenge for future governments and for our society.

6 Conclusion: Our Emission Choices Determine Climate

Windows to climate stability continue to close with our assistance, but a far better pathway is possible than the one being taken under current policy in Ireland. If we can choose the better path – by setting stretch targets within a carbon budgeted pathway – we can regulate, tax and redistribute revenue to enable the necessary equitable rapid transition to a low carbon future for a commensurate response to the climate change challenge that we can be proud of.

Instead of relying on uneconomic 'growth' based on carbon bubble energy and ruminant-agriculture, we can choose equitable resilience and support others around the world to do the same.

The IPCC state that:

> **Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions.**[44]

Any level of hope for re-stabilising the Earth's climate system requires action in line with physical reality by urgently and consistently achieving rapid and large cuts in GHG emissions from now onward. Achieving climate stability with climate justice – within Ireland and globally – requires that equity concerns strongly influence our emission choices from now onward. A +1.5ºC pathway, hugely preferably though it would be, may already be impossible; but we will need to work very hard to ensure that we in Ireland are not contributing to an extremely dangerous +3ºC or +4ºC world for our children's future.

A +2ºC pathway is still just about possible but already it will require a national emergency level of commitment by our society to achieve the levels of economic, societal and behavioural changes that really will deliver substantial and sustained reductions in GHG emissions year on year to 2050 and beyond.

As illustrated dramatically in Figure 12, our emission choices made now – the energy sources, the power stations, the type of agriculture and transport system, our personal choices, Ireland's honesty in facing climate change as a global issue – are all critical in determining the future of our planet and its people and ecosystems. We hope that together we will make our climate choices for the good of the very long term and for the entire world, not least because that will also undoubtedly be best for Ireland and its own future.

[44] IPCC (2013) AR5 WG1 SPM AR5 WG1 SPM p.19

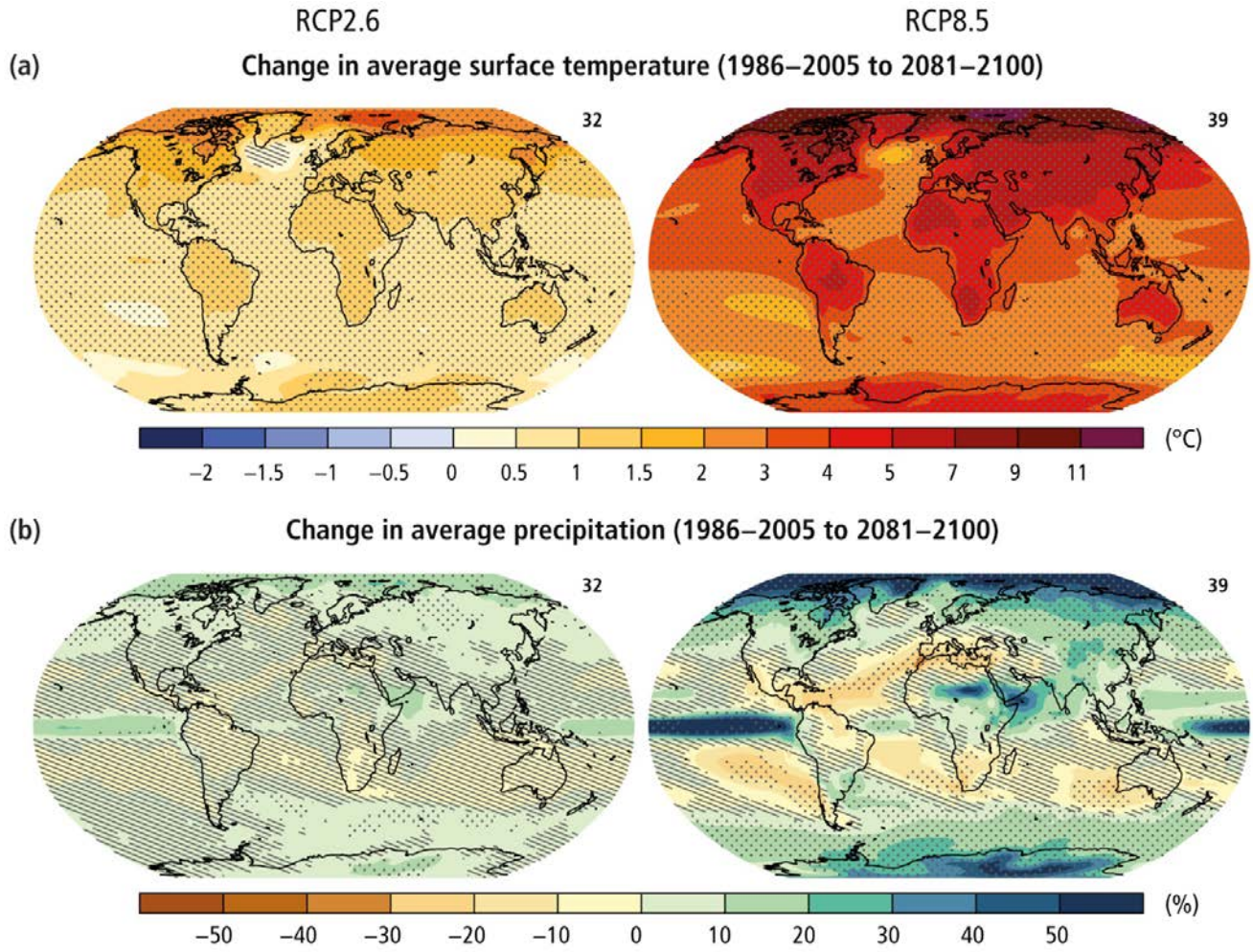


Figure 12: Our Emission Choices Now determine the very near future within the lifetime of many alive now and the very far future for those as yet unborn. On the left, strong mitigation delivers a safer and more stable climate. On the right, business-as-usual emissions create a very dangerous and quite possibly unstable climate future. Charts from IPCC Syn SPM FigSPM.7[45].

[45] IPCC (2014) Synthesis Report, Summary for Policymakers Figure SPM.7

Appendix:
Context not present in the NMP Discussion Document

Carbon Sequestration and Joined Up Thinking: Peatlands

An Taisce urges coordinated work among 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.

Peatlands are one of the world's most important ecosystems. Covering a mere 3% of the world's terrestrial surface, global 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 carbon means they have a net cooling effect on the global climate. It has been estimated that in the last 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 to the EPA's Bogland report (2011) peat soils cover 20.6% of Irelands national land area and contain more than 75% of the national soil organic carbon. Ireland's peatlands are estimated to store 1085 MtC, equivalent to 53% of all soil carbon in Ireland. **Near-intact peatlands may actively sequester c. 57,400 tC/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 are employed to stop and reverse the deterioration. Damaged peatlands become a persistent source of carbon dioxide (CO_2) and, at the national level, Irish peatlands have become a large net source of carbon emissions, estimated currently at around 2.64 MtC/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 National Mitigation Policy. 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.

Forestry

Outside of commercial forestry and native woodland establishment, the enhancement of hedges/trees/field margins has 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 only 10.5% of Ireland's land area.

Forestry is one of the tools that 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 (although strict IPCC accounting rules are needed).

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 on a genuinely "sustainable" basis.

Government must focus on the role of conservation, sustainable management of forests, and the enhancement of forest carbon stocks. The need to enhance and improve carbon conservation and sequestration must also be balanced against the potential difficulties in terms of measurement, controls and verification.