

Submission on the
Department of the Taoiseach - Economic Division
Discussion document for the preparation a National Policy Statement
on the Bioeconomy.

1. DEFINING THE ECOLOGICAL BASIS OF THE BIOECONOMY

Any economic plan or strategy must defer to the ecological foundation on which human society depends. The concept of the “bioeconomy” requires an understanding of the relationship between a rising human populations on a finite resource stretched planet, in the age of the 6th, and for the first time, human caused, mass extinction of species.

The 2014 and 2016 World Wildlife Fund (WWF) and Zoological Society of London “Living Planet” reports found that between 1970 and 2012 there was a fall of 58% in the global population of wild animal species and 81% of freshwater species.

The diminution of the global marine environment is overwhelming. A 2015 WWF report established that marine vertebrates including fish fell by 49% between 1970 and 2012. A 2015 international study “Population Trend of the World Monitored Seabirds 1950-2010” found a 70% decline. The increasing human impact through fishing, waste and chemical release on the ocean eco system remains inadequately understood.

There is an imperative for developed countries like Ireland to take leadership on protecting the natural world both at national level, and in international action. The basis for this was established by the UN Biodiversity Convention 1992 and integrated with the 2015 UN Sustainable Development Goals (SDG) in providing under:

Goal 14: “*Conserve and sustainably use the ocean seas and marine resources*”
and;

Goal 15: “*To sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss*”

The 2012 UN Rio Plus 20 Conference recognised and gave further status to “*the intrinsic value of biodiversity*” and “*its critical role in maintaining eco systems that provide essential services, which are critical foundations for sustainable development and human well-being*”

The 2012 EU Bioeconomy Strategy “*Innovation for Sustainable Growth*” opens with the statement:

“*In order to cope with an increasing global population, rapid depletion of many resources, increasing environmental pressures and climate change, Europe needs to radically change its*

approach to production, consumption, processing, storage, recycling and disposal of biological resources”,

And goes on to raise the overriding concern on biodiversity loss:

“Europe is confronted with an unprecedented and unsustainable exploitation of its natural resources, significant and potentially irreversible changes to its climate and a continued loss in biodiversity that threaten the stability of the living systems on which it depends”

2. WHAT IS WRONG WITH THE DISCUSSION DOCUMENT?

The focus of the discussion document is on development, *“to best capitalise”* economic opportunities and harnessing of natural resources. There is an unjustified assumption of the exploitative capacity of the biological environment particularly in relation to *“Moving from fossil based economy to a bio economy”* as stated on the title page.

The document is dominated by narrow economic considerations for developing Ireland’s biological resources for jobs and growth, further reflected in the heavily dominated industry based workshop facilitated by Teagasc in February 2017, which has influenced its framing. Much of the focus is on value chain addition and exploitation of waste, without addressing the sustainability of the relevant agricultural or marine exploitation processes involved in the first instance. The principle of *“Ensuring Food Security”* by increasing animal agriculture impact and export product levels is uncritically accepted.

It is only on pages 8 is reference made to *“the risk of over exploitation and loss of bio diversity”*. On Page 10 *“land and sea use change will need to be considered carefully to ensure protected areas, high nature value areas and the provisions of multi-functional use of productive agricultural sea and forest areas are maintained a required under regulatory regimes”*

This is treating protection of the natural environment as a regularity burden, rather than the foundation of all policy.

Policy and decision makers, particularly those in the public sector, have a responsibility to understand that the *“environment”* is not something to address as a burdensome afterthought to production- based economic targets. The UN recognised concept of *“eco system services”* provides the conceptual framework for the support of nature, not just for its intrinsic value which must be paramount, but the maintenance of eco systems in sustaining all life, water quality, soil fertility, pollination, flood attenuation, carbon storage, recreation and human well-being.

The draft bioeconomy discussion document as presented is not fit for purposes since it is based on an extractive exploitative consideration of the human relation to the world at large. Any further development of policy in relation to economic use of biological resources in Ireland must be integrated and underpinned by transboundary ecological footprint considerations and address the need to reverse biodiversity loss, including in the marine area.

It is also essential to ensure that an action designed to ensure one positive benefit, such as replacing fossil fuel with bio energy is not negative in other impacts. The EU Biofuels Obligation Scheme introduced as a climate mitigation measure which have multiple adverse impact. The concept of providing a progressive blend of biofuel to be brought up to 8 % biofuel

content from 2017 in Ireland, has proved negative in effect, as it does not address air pollution impact in perpetuating polluting diesel vehicle use, and reinforced the continued use of polluting internal combustion engine vehicles, disincentivizing switch to electric vehicles.

3. WHAT A NATIONAL BIOECONOMY STRATEGY NEEDS TO ACHIEVE

3.1 MITIGATION OF IRELANDS ECOLOGICAL FOOTPRINT

Three key concepts need to underpin the development of a national policy on the Bioeconomy:

1. **Natural Capital:** The natural resources and eco systems that support human life including plants, marine life, animals, air, water, soils, and minerals.
2. **Eco System Services:** Human society and economy is dependent on a climatically stable and healthy global eco system for soil fertility, fresh water, ocean life, clean air, energy, pollination and seed dispersal, and control of pests and diseases, which may be defined as “ecosystem services”. This is a concept contained in the UN Sustainable Development Goals 2015.
3. **Ecological Footprint:** Ecological Footprint measures the amount of biologically productive land and water area an individual, a city, a country, a region, or all of humanity uses to produce the resources it consumes and to absorb the waste it generates with today's technology and resource management practices. All countries as well as particular industries and activities can be measured both at national and transboundary level for ecological impact and carrying capacity.

Natural capital and eco systems have evolved to be self-sustaining. But increased human pressure – such as conversion of natural habitat to agriculture, overexploitation of fisheries, pollution of freshwater by industries, urbanization and unsustainable farming and fishing practices, chemical and waste contamination – is diminishing natural capital at a faster rate than it can be replenished. Combined with this, anthropogenic climate change is having a global impact in increasing food and water insecurity, increasing ocean acidification, exacerbation of conflict and migration, and increased vulnerability to natural disasters such as flooding and drought.

The concept of ecological footprint is the overriding consideration defining the human society relation with the host natural environment on which it depends. A rising global population requires the maintenance of a stable eco system.

The Living Planet Report 2016, released October 27th 2016, published by the WWF and Global Footprint Network shows that the overexploitation of ecological resources by humanity is directly contributing to a 67% plunge in wild vertebrate populations forecast for the 50-year period ending in 2020.

The top threats to species identified in the report are directly linked to human activities, including habitat loss, degradation, and overexploitation of wildlife. According to Global

Footprint Network, humanity is currently using the resources of 1.6 planets to provide the goods and services we demand each year while we only have one Earth.

Under a ‘business-as-usual’ path for the underlying drivers of resource consumption, increasing human demand on the Earth’s ecosystems is projected to exceed their regenerative capacity by about 75% by 2020, according to Global Footprint Network, which has collaborated with WWF on the biennial Living Planet Report since 2000.

3.2 REVERSING BIODIVERSITY LOSS

Ireland’s Bioeconomy Strategy needs to provide for the restoration of habitats and species with current “bad” or “inadequate” conservation status.

The 6 yearly Article 17 Reporting to the EU under the Habitats Directive on the status of habitats and species made in 2013 by the National parks and Wildlife Service (NPWS) shows the scale of the challenge facing Ireland.

Of the 59 “Habitat Overall Assessments” only 5 stood at “Favourable” status, 30 “Inadequate” and 24 as “Bad”.

Of the habitats identified as having “bad” status there are clear groupings that stand out: Firstly in relation to peatlands including raised and blanket bogs, wet and dry heaths; and secondly for biodiversity rich grassland areas including orchid- rich and species- rich grasslands, Molinia and Lowland hay meadows and tall herb grasslands.

Of the 61 “Species Overall Assessments” only half were “Favourable”. 11 were “Inadequate” including Atlantic salmon and Marsh Fritillary Butterfly with a continued decline of a number of snail species. 6 were “Bad” namely the Fresh Water Pearl Mussel, and its Nore variant, Sea Lamprey, Twaité, Shad and Pollan. The Natterjack toad, while listed as bad, was stated to have “genuine improvement” in comparison to the previous reporting period.

Updated data is awaited to determine if the major conservation work currently in progress has achieved reversal of the on-going decline of the Freshwater Pearl Mussel. The lack of data on a range of whale species left their status as “Unknown”. Agricultural intensification and forestry were identified as the main pressures on terrestrial and fresh water habitats.

For marine fish species, which are not reported under the Habitats Directive the latest figures from the European Commission's Scientific, Technical, and Economic Committee for Fisheries confirm that overfishing continues. According to the most recent updated data, 41% of fish stocks were still being overfished in 2015. Assessment and conservation status data on marine mammals and habitats generally in Irish waters is inadequate.

As a country with 90% of its territorial jurisdiction being in the marine area, there is a particular onus on Ireland to take leadership in marine life protection and the implementation of the EU Marine Strategy Framework Directive (MSFD).

The first objective stated in the 2017 NPWS Draft National Biodiversity Action Plan (NBAP) is to: “*Mainstream biodiversity into decision making across all sectors*”. This is not happening. The draft Bioeconomy discussion document reflects the continuing inadequate consideration of ecology and biodiversity in Irish public policy formulation. Government supported

production driven sectoral targets are allowed to drive agricultural, forestry, marine and general land use policy at the expense of natural habitats and other species, imperilling the well-being of future generations. There is an unjustified public policy conflict in Ireland between the intensification of agriculture, forestry and marine life exploitation, and the maintenance of the natural environment on which those sectors depend. This is the result of both the lobbying power of vested interests and allowing narrow short- term economics to prevail over climate and biological science. Unrealistic expectation and assumptions on the further role of bio energy in fossil fuel substitution and climate emission reduction created the risk of new conflicts, such as co-firing of biomass in power generation.

The An Taisce submission on Draft NBAP can be found at:

http://www.antisce.org/sites/antisce.org/files/25012017_an_taisce_submission_re_public_consultation_on_the_draft_national_biodiversity_action_plan_2017_-_2021_-_jan_2017.pdf

3.3 ENHANCING WATER QUALITY

In August 2017 the Environmental Protection Agency (EPA) published the 6 year reporting accounting to the EU of River Basin Management under the EU Water Framework Directive (WFD) It revealed that no effective progress has been made in meeting targets to improve the quality of Irish rivers, lakes and estuaries.

<https://www.epa.ie/newsandevents/news/name,62863,en.html>

The overall 13% improvement proposed for the 2010 -2015 period has failed, with little change in water bodies in an unhealthy state: at 43% from 45% for Irish rivers, the 54% figure for lakes unchanged, and estuaries marginally unchanged to 69% from 70%. The report also reveals increase in fish kills in 2013-15 in comparison to previous periods, and continued loss of the most high status waters.

The EPA figures release came a day in advance of the public consultation deadline for the Draft River Basin Management Plan, by the Department of Housing Planning Community and Local Government. This plan is intended to state how Ireland is to meet the EU obligation to achieve "Good Water Status" of river catchments by 2021, and where only limited derogation with specific justification is permitted after that date. The draft plan is lacking in ambition and capacity to meet the water improvement targets and measures required.

The plan does not provide any effective measures to reduce the impact of agriculture, and the 6% annual increase in the dairy herd since the lifting of milk quotas. The most recent data presented at the EPA National Water Forum in Galway in June 2017 reveals that thousands of farms are failing to comply with the Nitrates Directive, which limits the pollution impact on surface and ground water.

With climate change posing mounting flood risk, the draft strategy misses the opportunity to address the conflict with current bovine agricultural intensification and set out an effective river catchment response, including measures to slow downstream rainwater flows through historic flood plain restoration and other measures, in tandem with reducing nitrate and phosphate pollution.

In every area affecting water management the draft plan evades effective action in meeting of the WFD “Good Water Status” targets, in favour of continuing avoidance of effective regulation of forestry, peat extraction, water abstraction, aquaculture and other activity, and addressing the impact of Food Harvest 2025 targets.

An Taisce has set out recommendations in its submission on the Draft strategy: <https://drive.google.com/file/d/0BxEVOTzgFnKEcm9NWTNBNzkyU28/view>

4. ADDRESSING SECTORAL BIO ECONOMIC IMPACT

The development of a national Bioeconomy Strategy requires a preliminary analysis of the sustainability impact of each sector, with mitigation action.

4.1 AGRICULTURE

Agriculture is the lead threat to Irish biodiversity and water quality. Current quantity and export driven Irish agricultural targets as set out in Food Harvest 2020 and Food Wise 2025 are in direct conflict with maintaining and enhancing biodiversity, as well as climate mitigation.

The meeting of a range of environmental objectives including climate, biodiversity, soil, water and resource management, requires a reversal of current policy to increase the national herd. It is noted that the Netherlands has committed to culling their herd numbers by 200,000 while we plan to increase ours.

Food Harvest 2020 was approved without Strategic Environmental Assessment (SEA) Foodwise 2025 was subject to SEA, so that if monitoring of agricultural intensification shows adverse impacts, which is now clearly occurring, corrective action is required. The current annual cattle herd increases of 6% per annum is creating renewed water quality pressures in meeting the Nitrates Directive, and the overlapping impact of slurry and fertilizer run off affecting water quality. The most recent data presented by the Department of Agriculture at the EPA National Water Forum in June 2017 revealed that 12% of farms with a derogation are failing to comply and of the remaining 130,000, the failure rate is 30%. The integration of CAP farm support and Rural Development funding with Biodiversity is the overriding requirement. In 2015 An Taisce challenged the Department of Agriculture, Food and the Marine to explain why €400 million of funds allocated under the Common Agricultural Policy were diverted away from supporting marginal farmers and wildlife.

Successive EU funded REPS, AOS and GLAS schemes have not resulted in meaningful impact on Irish biodiversity protection and enhancement, and a complete re-think is required. The coalition of Irish development NGOs forming “Stop Climate Chaos” and “The Environmental Pillar” which both include An Taisce have published a report “Not So Green: Debunking the Myths around Irish Agriculture” in 2016. Link: <http://www.antaisce.org/articles/not-so-green-revealing-the-truth-behind-irelandsgreen-Image>

This challenges Government and industry claims on the sustainability of Irish agriculture concluding that “*Overall, Irish agriculture in its current form is damaging to climate, water quality and biodiversity*” and is not contributing to global food security.

It concludes that “*Agricultural intensification has caused significant negative impacts to Irish biodiversity*”.

It cites the impact of agricultural intensification or inappropriate afforestation causing the “bad” conservation status of a wide range of international Important Irish habitats, the decline of ten key farmland birds and that “one third of Irish wild bees are under threat of extinction”. Irish Agriculture is now using the marketing label of “Origin Green” which is not based on any independent internationally referenced standard, and being promoted as “Climate Smart” merely because the carbon impact is being counted, but not mitigated. The Origin Green label is open to international exposure as “Greenwashing”. Products given the Origin Green label include mushrooms produced with peat compost, sourced from bogs where there has been no Environmental Impact Assessment.

If Ireland is to retain the “green” image which is part of our self-identity this requires a new vision for land management, removing the current conflicts created by agricultural and conifer forestry intensification on water quality and biodiversity. There is an opportunity for water catchment based and area based initiatives for restoring the relationship with land use and nature, including peatland and flood plain restoration, wet woodland and other historic habitat restoration and area based High Nature Value farming for which the Burren Beo scheme forms a model which can be replicated in other locations.

4.2 PEATLAND MANAGEMENT

In 2011 the EPA published a synthesis scientific report “Bogland” on the issues affecting the 20% of the country with peat soil and recommended a range of 39 actions including to protect and enhance biodiversity as well as stopping carbon loss. The National Peatland Strategy 2015 is entirely inadequate in provision of resources, and timetabling of actions to meet these objectives, and is undermined by its accommodation of peat cutting vested interests for energy and horticulture. It will not achieve the reversal of the overall “Bad” conservation status of peatland and heathland habitats in Ireland’s Article 17 reports.

There is as yet no effective strategy or funded and supported range of actions required for Blanket Bogs and heathland areas which face multiple threats from, burning, overgrazing, invasive species, inappropriate forestry, inappropriate “recreation” such as quad bikes, peat cutting , and rising climate change impacts affecting established rainfall patterns.

While legal action by the EU Commission has resulted in a resourced Conservation Plan being at last put in place for the remaining 1% of Irish Raised Bogs, in conjunction with the turf cutting cessation scheme, this is occurring 15 years after it should have been initiated. The deliberate burning of land is widespread on commonage and upland areas, affecting designated species and habitats, destroying nesting birds and invertebrates, and causing soil erosion, carbon loss and water pollution. May 2017 had some of the worst ever fires including the whole surroundings of Gougane Barra in Cork and a fire extending six kilometres in length in the Cloosh valley in Galway. These fires are started deliberately for land management and should be classified as wildlife crime, yet no prosecutions occur. Effective action is required; including criminal sanction and removal of farm payment grants for landowners starting illegal fires.

If climate change generates more variable rainfall patterns with longer drier periods in late spring/early summer this is going to increase fire damage risk and impact and erosion. The

state of our upland bog and Heath areas has a knock on effect on other species with the national Red Grouse population having fallen by 66% since the late 1960s.

Bord na Mona although advertising itself as “Naturally Driven” has no strategy in place for exiting and the restoration and carbon management of the degraded cut away peatlands. A 2030 target has been adopted for ceasing peat burning electricity, but this extends the use of co-firing peat with biomass which is problematic in its use of imported material, including palm kernels from south east Asia, and the lack of identification of the scale of sustainable indigenous biomass required, as well as the carbon efficiency of mass burning for electricity generation.

Neither Bord na Mona nor the other companies involved in large scale peat extraction for horticulture have adopted an exit date for what is a destructive extractive industry, and the phasing in of alternative sustainably sourced and produced compost products. Continued peat extraction in all categories of exploitation is occurring without Environmental Impact Assessment, despite a European Court judgment against Ireland in 1999.

A sustainable Bioeconomy Strategy for Irish peatlands requires large scale engagement with rural communities and the wider public on the multiple benefits of peatland conservation for biodiversity, flood attenuation, carbon storage and amenity. This requires enhanced direction of resources, and timetables and targets for action which are entirely lacking in the content and of the current National Peatlands Strategy 2015

4.3 FORESTRY

An Taisce has particular insight into the Irish forestry consent and management regime through bring a consultee on the Forest Service application process. Since An Taisce's founder Robert Lloyd Praeger raised concern on the developing "*regimented rows of conifers*" in 1948, Ireland has pursued a continuing policy of non-native conifer plantations with negative impact on biodiversity, landscape, carbon and water quality and causing of soil erosion. The only difference is that new forestry development is now occurring on private land, with the Coillte landholding no longer being expanded. Conifer forestry is also causing increasing concern on social impact in counties like Leitrim. This continued model conflicts with more sophisticated alternative strategies of supporting High Nature Value farming schemes and restoration of historic native woodland in ecologically appropriate locations. Only 2% of the country is covered by what is native or semi natural woodland and much of this is highly fragmented. The current forest programme has to date failed to achieve the modest targets set for increasing native woodland and broadleaf cover. Areas with non-intensive farming are also those which are most habitat rich and would benefit most from targeted support actions such as the Burren Beo High Nature Value farming initiative.

The EU and the State is supporting a forestry programme which is not meeting its stated objectives and is creating biodiversity loss rather than biodiversity enhancement. New forestry development is focused on semi natural habitats associated with low agricultural output. This afforestation is continuing without adequate ecological assessment in breach of the Article 6(3) Habitats Directive requirements for Appropriate Assessment.

The need for a full Appropriate Assessment is often screened out and cumulative impacts not properly assessed including on Hen Harrier breeding and foraging habitats. There is a lack of personnel with ecological expertise in the assessment and decision making process. Drainage to enable plantation, use of herbicides and pesticides and clear felling have a run off effect

affecting water quality and ecosystems, including catchments in the vulnerable Fresh Water Pearl Mussel population areas.

In Ireland's 2013 report to the European Commission on Habitats and Species, forestry rated as the second greatest pressure and threat on designated habitats and species after agriculture. Forestry regulations are failing to protect Annex I Peatland habitats such as Wet Heath, Dry Heath, Alpine and Sub Alpine Heath Rhynchosporian depressions, Active Blanket Bog, Rare Grasslands such as Annex 1 Molina Meadows and other species rich grasslands which are being lost in areas like the Comereaghs, Devils Bit and Slieve Blooms. Semi natural grasslands are important for the Irish hare and range of birds including Lapwing, Curlew and Hen Harrier as well as bees and butterflies. The Hen Harrier in particular has been affected by the loss of its traditional foraging and nesting habitats.

An Taisce has made a detailed submission and recommendations on these issues to the Forest Service through the consultation on the Mid Term Review of the Forestry programme for 2014-2020.

Link:

http://www.antisce.org/sites/antisce.org/files/20170502001_an_taisce_submission_mid_term_review_-_forestry_programme_for_2014_-_2020.pdf

4.4 MARINE LIFE

The EU MSFD provides for a transboundary eco system based approach to the marine environment. This conflicts with the continued pressure to maximise fisheries quotas under the Common Fisheries Policy over scientific advice on safe levels for individual species stability. Ireland's 2012 policy for the marine area "*Harnessing our Ocean Wealth*" was adopted without Strategic Environmental Assessment and is based on an exploitative rather than eco systems based vision.

The post medieval history of Irish marine exploitation is a cycle of over exploitation and collapse of species, only then to move on to the next species. Ireland has lost the once abundant shoals of pilchards, (sardines), mackerel and herring and oyster beds around the coast over the last few centuries. The basking shark was fished to near collapse by the mid-20th century and the angel shark is now endangered.

The internationally recognised fisheries biologist Daniel Pawley has defined the term "shifting baselines" to explain the avoidance of addressing the long term decline of fish and other marine species so that "normal" is seen as an ever deteriorating point of reference with fewer fish and fewer species. Eventually what Pawley defines as "fishing down the food web" leads to tipping points which are reached whereby the larger fish are removed leaving less fertile specimens leading to "trophic cascade" with the breakdown of the marine food web and a diminished marine environment where crustaceans and jelly fish dominate. Pádraig Fogarty the former Director of the Irish Wildlife Trust in his overview of the Irish natural environment published in his book "Whittled Away" in 2017 which states that we need "*a total reorganisation of the way we fish so that marine habitats and species can be restored to their former abundance*". With no fish or vertebrate afforded legal protection under the Wildlife Act of 1976 "*Ireland is the only country bordering the North Atlantic where marine life is not officially acknowledged as wildlife*". He describes the Irish Sea as now "*an ecological wreck, with the fisheries for cod, sole and whittling having collapsed and bottom trawling taking place so that many parts of the sea floor are hauled over up to seven times a shadow of what it once was*".

Irish inshore waters where there is full national legal jurisdiction within the 6 mile limit are facing multiple threats and pressures. Dredging for scallops and clams is continuing in a manner entirely damaging to the sea bed and ultimately destructive to the resource which is being exploited. Bottom trawling generally is irrevocably degrading the sea bed eco system.

The exploitation of marine plant life as part of a new bio economy is an emerging development. New pressures that exploit marine vegetation are being allowed without proper assessment including mechanical kelp extraction in Bantry Bay.

The EU Common Fisheries Policy (CFP) has three years remaining to meet the legally binding deadline to end overfishing by 2020. This requires effective member state implementation. MSFD, which requires an eco-system based approach to the management of the marine area, provides the means for Ireland to take leadership in marine conservation. This includes the key provisions to designate Marine Protected Areas (MPAs).

MPAs could include location based protection to a range of marine species and habitats including the vital feed source for sea birds. The use of MPAs to restrict fishing have been internationally demonstrated to be of major benefit to population regeneration with an impact on areas outside the MPA. Threat Response Plans are required for particular endangered species such as the Angel Shark.

4.5. AQUACULTURE

The sustainability of all categories of continued aquaculture needs update and review, addressing feed sources, sea floor impact, and in the case of salmon farming lice infestation and interaction with wild species. The continuation of Pacific Oyster cultivation needs to be reviewed because of invasive impact on native species and marine habitats.

Aquaculture has a significant potential impact on biodiversity, is a significant water management issue affecting WFD targets, as well as overlapping with MSFD compliance. Intensification of aquaculture is being promoted by Government policy through “*Harnessing Our Ocean Wealth*” 2012. *The National Strategic Plan for Sustainable Aquaculture Development* (NSPA) 2015 projects an increase of output with “...of 45,000 tonnes in the output from the sector by 2023, taking 2012 as the base year, with an output of 36,700 tonnes. This combination gives an estimated production volume outturn of 81,700 tonnes by the end of 2023”. This represents a 122% increase.

The impact of aquaculture potentially affects water quality, habitat integrity and biodiversity. Farmed species pose an escape risk, and are problematic in interaction with indigenous species populations. Fin fish farming creates increased nutrient loading around cages through excretory wastes and uneaten fishfeed, which can cause algae and contamination of shell fish. Finfish farming creates risk of pathogens, parasite and other contaminants and pollutants. The causal link between fish farms and increased incidence of lice and sea among wild Atlantic salmon and sea trout stocks has been well documented internationally. The impact of the range of antibiotic and other chemical treatment used in fin fish farming remains undetermined including crustacean reproduction.

Fin fish escapee risk creates conflict with wild fish population in competition for food and disease transfer. In February 2014 230,000 adult farmed salmon escaped from cages at Gerahties at Bantry Bay during a storm. Treatment of diseased and fish kill waste poses a risk to receiving waters, and is not currently subject to adequate regulation. Current regulation is also inadequate in relation to freshwater abstraction and land based impoundment taken for treatment of amoebic gill disorder, or rearing of smolts, as shown by cases in Connemara in 2014 and 2015. Shell fish farming may reduce feed sources for other organisms and risk parasite or pathogen infection.

The cultivation of Pacific Oysters is creating major new invasive species risk in Ireland. Containment failure breaks in Pacific Oysters cultivation, poses major risk in displacing indigenous oyster and mussel habitats.

The coalition of Irish NGOs forming the Sustainable Water Network (SWAN) has raised major issue with the monitoring, oversight and governance of aquaculture and WFD River Basin Management and targets. The National Strategic Plan for Sustainable Aquaculture Development (NSPA) states that the regulation of the sector to “*ensure compliance with relevant European and National legislation*” including “*legislation seeking to achieve and maintain good environmental status of coastal and marine waters (Water framework Directive, Marine Strategy Framework Directive)*”. SWAN has examined the SEA for the NSPA, establishing that it does not deal with impacts and risks to the wider water body as a whole, with shell fish monitoring confined to human health issues, and that “*there are no monitoring programmes that can define the impact on the level of a water body as defined by the WFD*”

4.6. BIO ENERGY

Measures to reduce GHG (Greenhouse Gas) emissions and energy import dependence through bio energy use need to be integrated with wider public health objectives including reduction of air pollutants and should be subject to full carbon and sustainability accounting and address trans-boundary impacts.

Limited modelling has been done on what a decarbonised Ireland towards 2050 would be through EPA funded research to University College Cork. <http://www.energyireland.ie/the-future-of-renewable-energy-in-ireland/>

This is based on modelling of both significant increased bioenergy sourcing and import in Ireland, for transport, electricity generation and heating.

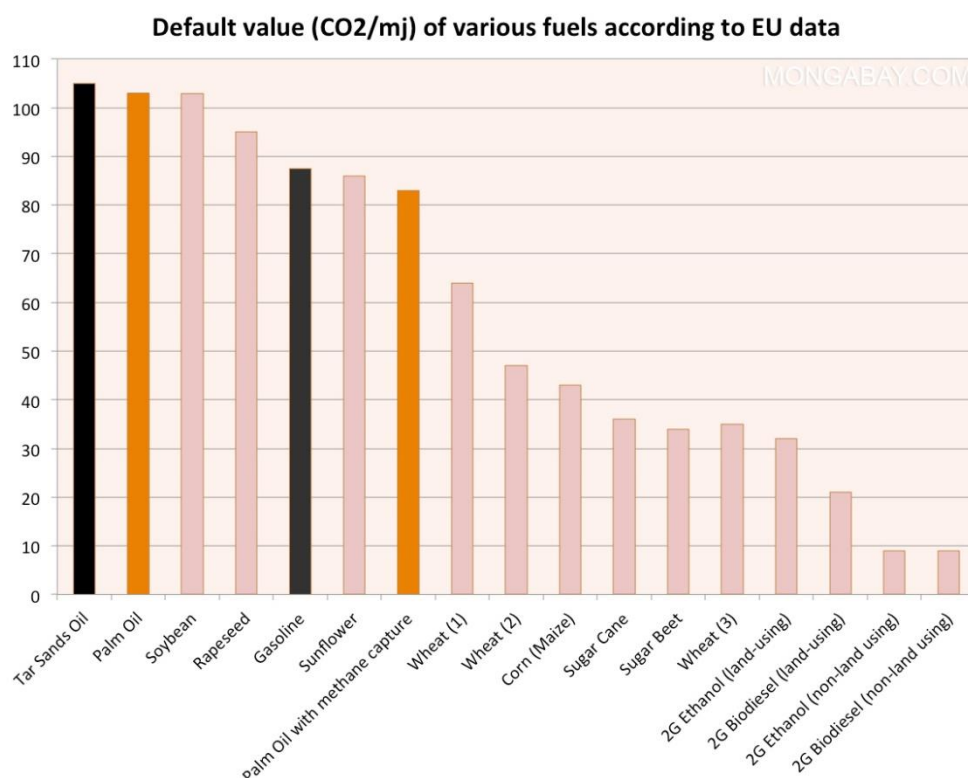
Current European energy and climate policy has created a trans-boundary distortion favouring the import of bioenergy into Europe. This is a fundamentally perverse and inappropriate result transferring emissions, land and resource impacts to other countries, creating food production displacement, biodiversity loss or unsustainable water consumption.

It makes no sense for countries which are themselves fossil fuel consumers to export bioenergy no matter how “sustainable” to the EU. Furthermore, the adequacy of the vetting of information on the sustainability of bioenergy sources, particularly imported from outside or produced in the EU, is problematic since so much is left to the supplier in what amounts to a self-certifying system. The Volkswagen emissions scandal has undermined confidence in any industry supplied data.

The adoption of bioenergy as “carbon neutral” under the Kyoto Protocol in 1992 was the result of the limited accounting capacity at that time. The accounting methodology is now available to measure the actual emission level of different biofuels.

In 2012 the EU published research showing the actual emission impact of different types of biofuel compared to petrol. Accounting methodologies also allow the full emission impact of combustion of bio material for power generation. In a 2015 report Transport & Environment Europe stated:

“We must also consider the potential time delay between release of carbon from biomass burning and its recapturing by plant growth (also known as carbon debt). The payback times range from zero (short rotation plantation in Austria on marginal agricultural land with low carbon stocks) to almost 500 years (forest biomass removed for fire prevention on old growth forest in Western Cascades in US)”.



Capacity to produce bioenergy from “waste” as a by-product from other crops is limited. The sustainability of the continuation of current levels of biofuel processed from “waste” such as cooking oil must be questioned since efficient resource use should seek to reduce material consumption, and therefore waste. For crop wastes, organic compost recovery to substitute the use of peat or chemical fertiliser may be more sustainable than bio fuel or biogas refining

In 2015 the lead international development NGOs published a significant evidence based policy position to inform EU policy:

[“Pitfalls and Potentials: The role of bioenergy on the EU climate and Energy policy post 2020”](#)

The report recognises that sustainable bioenergy has a role to play in Europe's transition to an energy system based on renewable energy and energy efficiency. However identifying the potential of bio energy exploitation to negative consequences for carbon emissions, biodiversity and in creating land use conflicts, the report, which has been endorsed by European NGOs, recommended the introduction of four main safeguards for bioenergy use as part of the EU's 2020 to 2030 climate and energy policies:

1. Introduce a cap to limit the use of biomass for energy production to levels that can be sustainably supplied;
2. Ensure efficient and optimal use of biomass resources, in line with the principle of cascading use;
3. Include correct carbon accounting for biomass; and
4. Introduce comprehensive binding sustainability criteria.

These principles should inform The Department of Communications, Climate Action and Environment public consultation on the development and design of a new Renewable Electricity Support Scheme (RESS) for Ireland, which includes bio energy.

4.6.1 TRANSPORT

Bio energy is presented as a solution to transport GHG emissions through two means:

1. The dilution of fossil fuel with bio diesel; and
2. The development of bio energy vehicles, particularly through bio gas.

The EU biofuel obligation, which is a support of dilute addition of bio fuel to fossil fuels has the effect both at EU level and in Ireland in:

- Perpetuating the continued use of damaging health impact polluting diesel and fossil fuel generally, and disincentives the switch to lesser polluting technologies including electric vehicles.
- Creating a false European market promoting unsustainable biofuel import for outside the EU from countries that should be reducing their own emission footprint, rather than exporting bio energy.

The current basis of EU policy is to attach accounting and sustainability criteria to biofuels currently through European Union (Renewable Energy) Regulations, 2014 (No. 483 of 2014). The Europe Wide organisation Transport and the Environment questions the entire sustainability of a biofuel content:

"Every car in Europe uses a blend of biofuels, and this drives global production of biofuels. That means more deforestation, releasing stored-up carbon and driving up global food prices."

www.biofuelsreform.org

The potential of a sustainably produced and coerced bio gas of any scale remains unresolved. In the short term, as with biofuel dilution, there is a risk that the insertion of a "sustainable" bio gas content into the gas grid could create a new generation of lock in of investment into gas

based technologies, without being able to achieve the progressive real decarbonisation needed, and impede alternative technologies.

4.6.2. ELECTRICITY GENERATION

Current EU energy and climate policy has facilitated the development of wood biomass burning for electricity generation, both for material produced within the EU and imported, mainly from the US.

To date the only major use of bio mass material for electricity production in Ireland is the 30% co-firing in the Edenderry Peat plant. This undesirably perpetuates unsustainable peat burning use, and include the unsustainable import of palm kernels.

Ireland must avoid the superficially attractive option of using biomass to replace coal and peat. In 2014 the UK Department of Energy and Climate Change published a report "*Life Cycle of Biomass Electricity in 2012*" by Dr Anna Stephenson and Prof David J MacKay FRS. Its conclusion on different bioenergy scenarios stated "*However, there are other bioenergy scenarios that could lead to high GHG intensities (e.g. greater than electricity from coal, when analysed over 40 or 100 years) but would be found to have GHG intensities less than 200 kg CO₂e/MWh by the Renewable Energy Directive LCA methodology.*" <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.696.6944&rep=rep1&type=pdf>

A UK Chatham House report published in February 2017 establishes that the burning of Biomass is not carbon neutral, as it "*emits more carbon per unit of energy than most fossil fuels*" and has a range sustainability impacts.

<https://www.chathamhouse.org/publication/impacts-demand-woody-biomass-power-and-heat-climate-and-forests>

The burning of biomass whether for electricity generation or directly for heating has a range of other polluting emission impacts. <http://www.biofuelwatch.org.uk/wp-content/uploads/Biomass-Air-Pollution-Briefing.pdf>

There has also been an increase in PM_{2.5} emissions in Europe recently due to increased use of biomass for heating which has been incentivised by governments. [*World energy Outlook Special Report 2016. See graph representing increase in household OM_{2.5}. Figure 2.1 pg., 64 showing increase in biomass for heating mainly, but also power production*].

http://www.iea.org/publications/freepublications/publication/weo-2016-special-report-energy-and-airpollution.html?utm_content=buffer2d38e&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

There is increasing research and concern on the air pollution impact of biomass burning for electricity generation in the US. The 2014 report *Trees, Trash, and Toxics: How Biomass Energy Has Become the New Coal*, submitted to the U.S. Environmental Protection Agency (EPA) by the Partnership for Policy Integrity (PFPI), found that per megawatt-hour, a biomass power plant employing "best available control technology" emits more nitrogen oxides, volatile organic compounds, particulate matter and carbon monoxide than a modern coal plant of the same size. <http://www.pfpi.net/wp-content/uploads/2014/04/PFPI-Biomass-is-the-New-Coal-April-2-2014.pdf>

"The American Lung Association has opposed granting renewable energy subsidies for biomass combustion precisely because it is so polluting," said Jeff Seyler, president and CEO of the American Lung Association of the Northeast. *"Why we are using taxpayer dollars to subsidize power plants that are more polluting than coal?"* <http://www.ecowatch.com/biomass-electricity-more-polluting-than-coal-1881884788.html>

The Bord na Mona Edenderry Plant is co-firing biomass with peat, and co firing is currently proposed for the other two midland peat power stations. The air pollution impact of this needs full research in addition to all of the concerns relating to carbon emissions and other sustainability considerations.

A 2017 Finish study on a co-fired biomass and peat heating boiler *"Emissions and ash behaviour in a 500 kW pellet boiler operated with various blends of woody biomass and peat"* found that co-firing with biomass actually reduced PM1 from peat due to the alkali metals combining with silicates from the peat. On the other hand, the co-firing of peat with woody biomass significantly increased NOX, SO2 and HCl emissions, and both NOx and SO2 are important precursors for secondary aerosol formation in the atmosphere. Due to this and the non-renewable nature of peat, the co-firing of peat has also negative environmental effects. <http://www.sciencedirect.com/science/article/pii/S0016236117303988> 34

Bioenergy from indigenous and imported sources is being currently modelled as a significant component of Ireland's future energy mix in the EPA supported work by the Sustainable Research Group UCC.

In 2015 The EPA submitted a *"[SEA Scoping Submission on the Proposed National Bioenergy Plan](#)"* setting out the Environmental Protection Agency's recommendations to be considered in the preparation of the Plan and associated SEA Environmental Report. In relation to the issues of air pollution it stated:

"Combustion of biomass will also result in emissions of other pollutants such as nitrogen oxides (NOX), sulphur dioxide (SO2), carbon monoxide, polycyclic aromatic hydrocarbons (PAH) and PM10 particulates. The EPA report „Air Quality in Ireland 2013 – Key Indicators of Ambient Air Quality" stated that future PAH concentrations in Ireland will likely depend on the choices of fuel for home heating that is used by the public in Ireland in the coming years. The report notes that peat, wood and biomass are high in PAH, especially when burnt inefficiently. The overall impact of switching to biomass on the concentrations of these pollutants in the atmosphere should be considered as part of the SEA.

To meet the PM2.5 NERT (National Exposure Reduction Target) Ireland must reduce PM2.5 emissions by 10% by 2020. This should be included as part of any consideration of the impacts of the plan. In particular the potential for emissions abatement techniques or technology to address increased particulate emissions due to biomass should be analysed. Policies encouraging the use of biomass should be tailored to ensure facilities and consumers are directed towards efficient combustion methods and biofuels with the lowest emissions. "

4.6.3 HEATING

Any consideration of the potential for bio energy as a heating source requires vetting of financial, administrative, land use air pollution and climate impact.

The investment priority should be in reducing heating demand through retrofitting. The overriding need is for a national retrofitting scheme funded by direct grants, tax relief and loans integrated with “pay and save” schemes.

The main potential for any sustainable use of bio energy is in district heating schemes including heating from Combined Heat and Power (CHP).

The direct burning of solid fuels at domestic level whether in open fires or stoves is problematic in principle. There has been an increase in PM2.5 emissions in Europe recently due to increased use of biomass for heating in people’s homes particularly through stoves. This requires that any continued use of direct burning of timber requires advancing of proposed EU “eco-design” standards for stoves.

As with transport and electricity generation the principle of blending a biomass content with solid “smokeless” coal based fuel is problematic in principle, as currently proposed by Coal Products Ltd (CPL) in Foynes Co Limerick, as it perpetuates inefficient open fire use.

The risk of creating a new dependency on individual gas boilers needs to be considered. Current assumption by Gas Networks Ireland that an increasing quantity of “renewable” gas can be inserted into the grid, or future gas electricity generation can have viable carbon capture, have not been validated.

Creating a new lock in of dependency of gas heating, particularly of boilers at individual household level, undermines alternative renewable heating systems, heat pumps and development of district heating, geothermal or other systems.

International NGOs favour charging a carbon pollution fee on all carbon dioxide emissions, including those from burning biomass at the same rate as the current carbon tax on fossil fuels. This revenue raised can then be used to fund the retrofit measures in both the ETS and Non-ETS sectors that will reduce both heat demand and emissions. Only if they meet strict sustainability criteria, and show real emission reductions, should biomass and biogas production be supported on a feed-in tariff basis like other renewables.

5. RESPONSE TO QUESTIONS

1. Does the broad definition outlined adequately encompass the opportunities presented by the bioeconomy?

Constraints as much as opportunities need to be identified. The definitions outlined, lack consideration of the ecological constraint of a finite planet and the requirement to ensure that use of biological resources is compatible with the maintenance of planetary ecosystems. The entire document is marked by an uncritical exploitative view of the terrestrial and marine environment, and does not address the particular issues facing Ireland, including biodiversity loss and water quality.

2. How can a high-level policy statement on the bio economy assist in progressing the development of the priority value chains identified?

A high level policy statement needs to both identify both the constraints, as well as the potential carrying capacity for biological resource use, compatible with enhancement of Irish terrestrial

and marine eco systems, and meeting the per capita level of climate emissions reduction required by climate justice principles.

3. What lessons can Ireland take from the European approach, including to the Circular Economy?

If the EU led initiative on the Circular Economy is to be given meaningful effect, the EU and international transboundary footprint of current level of national and EU per capita resource consumption needs to be reduced.

4. Given the cross-sector nature of the bio economy, how can a national policy statement best support development?

A national policy should provide cross cutting sustainability principles applicable to all sectors and to define the limit and carrying capacity of use of biological resources.

5. Can we identify a common set of principles, including in particular the application of the cascading principle, which will assist in the development of both the bio economy and circular economy?

The cascading principle requires that the enhancement of bio diversity, and the reaching of Good Environmental Status for the marine area as define by the Marine Strategy Framework Directive, and the reduction of transboundary ecological footprint, be over riding principles.

6. How can a national policy statement support local and regional cooperation around the use of renewable biological resources?

The national policy should provide for real sustainability auditing methodology and regulation for all sectors of biological resource use including impact on biodiversity, and climate emissions. The blanket definition of biological resources as “renewable” has no physical or scientific basis.

7. How can waste policy, including an examination of the definition of waste, best support developments in the bio and wider circular economy?

Securing a reduction in the production processes and consumptions patterns that create waste should takes precedence.

8. How can we stimulate market demand for bioeconomy products? What is in it for the consumer?

Stimulating market demand for any product as an end in itself is inappropriate in principle. The objective for the individual consumer should be the meeting food calorie, energy and other needs with less climate, land use and resource footprint.

9. What is the most appropriate mechanism to coordinate development and monitor progress?

Progress should be monitored according to:

- Climate emission impact including land use;
- Ecological footprint rating;
- Reporting of status of habitats and species under the Habitats Directive;
- Reporting of status of surface and rounds water under the Water framework Directive;
- Reporting of “Good Environmental Status” under the Marine Strategy Framework Directive; and
- If monitoring establishes negative impact in any sector then corrective action is required.

10. Are there any other issues to be addressed through a national policy statement?

How to achieve the cross sectoral governance and implementation of real sustainability targets on biodiversity, water quality and reduction of resource use.