

Our Climate, Our Responsibility



Introduction

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Climate Change by definition is a change in global or regional climate patterns, in particular a change apparent from the 20th Century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.

Ireland has experienced a mean temperature increase of 0.7°C since 1890, with over half of that increasing coming since 1980. This shows that climate change is speeding up, and we're not doing an awful lot to stop it.

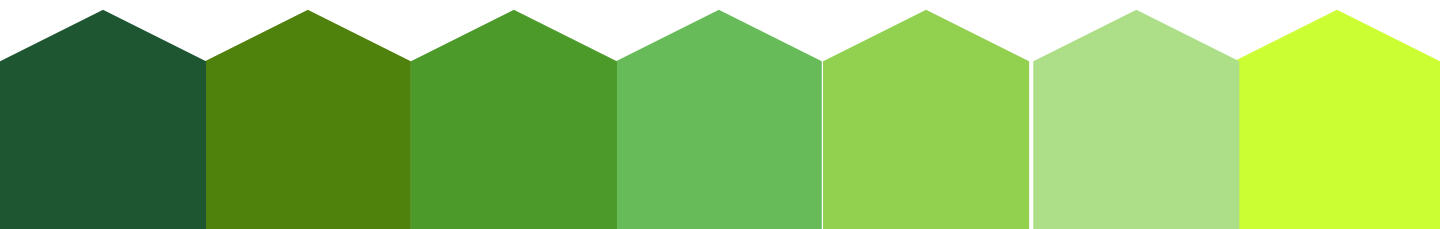
Action against climate change must be collective. We are all being affected by the changes to our planet no matter who you are, no matter what your background is, no matter whether you believe it's happening or not.

This is not something for us to protect future generations against, this is something that is affecting us all today. Action is required now to ensure that we have a planet to live on, and to pass on.

I want to sincerely thank the Ógra Climate Action Committee who worked tirelessly over the past few months researching and brainstorming to put this policy together. This policy is a reflection of both their hard work, but also their desire to tackle climate change.

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Ógra Climate Action Committee 2019





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Key Points

1. Update Junior and Leaving Certificate Geography curriculums to provide further scope for climate based education in classrooms.
2. Integration of climate education into the primary level SESE curriculum.
3. Update and modernisation of the Green Schools programme.
4. Provide supports to encourage more low waste approaches to classrooms.
5. Increase of the Carbon Tax to €80/t within 9 years.
6. Reform the current Carbon Tax system to provide for the return of revenue raised in the form of a monthly dividend.
7. Introduction of a 50c levy on single use plastics.
8. Special rate of income tax for researchers.
9. Acceleration of capital allowances for fuel alternative projects.
10. Phased-in introduction of free public transport by 2030.
11. Investment in the upgrading of our public transport network.
12. Reform of the current school transport system.
13. Daily cap of €7.50 for students on public transport.
14. Free public transport for U12's.
15. Ringfencing of funds at local and national level for the maintenance and upgrading of cycle lanes.



Key Points

16. Introduction of legislation to ban the use of earphones (etc) while cycling.
17. Allow cyclists turn left at red light junctions.
18. Introduction of university bicycle schemes.
19. Lowering of VAT on bicycles and cycling equipment.
20. Introduction of new incentives for electric cars.
21. Increase in funding for agricultural research.
22. Change in government funded forestry project priorities towards carbon capture instead of commercial felling.
23. Planting of native broadleaf forests with the aim of maximising carbon sink capacity.
24. Introduction of a long-term cross border rewilding strategy.
25. Investment in oceanic windfarms.
26. Repeal of s.18 of the Electricity Regulation Act (1999).

Our Policy – Drivers

6/10

warmest years
on record have
occurred since
1990

0.7°C

increase in
Irish mean
temp. since
1890

Our Future Economy

- Increased volatility and disruption to the economy
- Financial cost of extreme weather events being felt
- Water shortages already acute in Leinster during the Summer

Our International Partners

We believe in playing our part internationally

- Meeting our COP21 Commitments
- Reaching our UN Sustainable Development Goals
- Contributing to the EU 2030 strategy

Our Communities

- Rising sea levels threaten our coastal communities
- Flooding is affecting our towns and cities
- Ocean acidification threatens our fisheries
- The natural environment is key to renewal of rural economy and eco-tourism

The human and natural environment

- Critical loss of biodiversity
- Wetlands, native forests and bogs have a role to play in the climate change solution through carbon sinks
- The state of the natural environment has a direct bearing on the human environment

2020

- *Education Program*
- *Carbon Dividend*
- *Cycling Policy*

2019

- *Levy on single use plastic*
- *R&D Program*
- *Agriculture R&D Program*

2021-24

- *Changes in Agricultural practices*
- *Repeal of Electricity Regulation Act (1999)*

2025

- *Environmental changes in Agricultural practices*
- *VAT and Grant regime for e-cars*
- *Oceanic windfarms*

2027

- *Rebooted native forestry policy*
- *Construction of nuclear installation commences*

2030

- *Rewilding of marginal land and valuable ecosystems*
- *Free Public Transport*
- *Public car fleet largely converted to electric and hydrogen power*

2030-40

- *Shift towards a nuclear powered baseload source of electricity*



€20 billion the capital cost of adding 3.6GW of carbon free baseload to our electricity grid

€110 million per annum for comprehensive environmental education program



€580 million per annum to fund free public transport



€1.32 billion increased grant of €800 for every home in the State for home chargers

ógra
Fianna Fáil



Education

Junior and Leaving Certificate Geography

Junior and Leaving Certificate geography must be made central to the core aspects of our youth education due to the ability to explore natural issues. The curriculum needs to be updated to reflect modern scientific reports and provide a strand or further scope for more climate based education in the classroom. This subject is the perfect area to integrate due to it already covering much of natural geography and manmade geography so we can integrate easily providing the NCCA allow for this change. This will also tie into greater social awareness of the impacts of action and consequences.

Climate Education through SESE (Primary)

It is of steady support in education colleges among tutors (St Pat's DCU, MIE) that climate action education must be integrated into the classroom curriculum either by SPHE, SESE or both. Ógra proposes on recommendation from those who investigated and worked with the SESE primary curriculum, that climate education best slots into SESE. This needs to be worked in via a new strand dedicated to 'My environment and my impact' perhaps from first class onwards.

Sustainable Development Goals

The United Nations Sustainable Development Goals are a key baseline to educating on climate action and other key social issues. The core of these SDGs is the importance of linking issues with one another to create widespread effects rather than isolating climate alone. Ógra proposes that these be worked into wellbeing in the Aistear curriculum, SPHE/SESE at primary level, SPHE and Geography at second level and linkage into third level courses would be ideal. This would provide scope for responsible and guided education with support from multiple organisations to carry these out

Green Schools + HEA implementation

Green schools programme needs to be updated and modernised with updated scientific evidence and recommendations. It is of our recommendation that all education centres from early childhood to third level attempt to work these guidelines and goals into their settings.

Plastic free / Low Waste Education

Reducing the usage of plastic and waste in our classrooms is already being encouraged by DES. Ógra proposes that we fall in line with this and advise that supports be provided to encourage more low waste or environmentally conscious approaches to classroom educations. (Such as using recreate centres for materials and further usage of recyclable materials rather than non recyclable and reduction of handout usages). This needs to be led by example - removal of unnecessary plastics on government funded schemes in classrooms is essential. Instead, funding and efforts should be focused on supporting a more sustainable and eco conscious approach to classroom education.



Carbon Dividend

Ógra is proposing to reform the current Carbon Tax by imposing an increase of €20 (an increase to €40/tonne), with a gradual increase in the tax to €80 per tonne within 9 years (€5/tonne increase per annum).


Ógra further proposes that the revenue raised from this tax be returned to the citizens of Ireland in the form of a monthly dividend called the Carbon Dividend. This is a tax-and-dividend system that will enable us to rapidly speed up the process of decarbonisation in Ireland. We are seeking to model a behavioural change by taxing the use of carbon but also protecting the most vulnerable in society from further taxation. The Carbon Dividend will facilitate an increase in the carbon tax and thus provide the government with an appropriate tool to stifle the demand for atmosphere-harming carbon-based fuels. This system will further incentivise investment in energy efficiency and the transition to low-carbon energy sources.

Everyone in Ireland suffers equally from the consequences of our carbon emissions. These emissions are contributing to climate change and nobody is immune to the effects it is having on our cities, towns and villages. However we don't all emit carbon equally therefore those who emit the most should be taxed the most. This is the purpose of a carbon tax. We do already have a carbon tax system but it is critically flawed as the current rate of taxation is too low and is not effective enough for us to meet our 2030 emission targets.

The ESRI has found that we will not meet our current climate targets and objectives by 2030 even if we double the carbon tax from €20 to €40 per tonne of carbon emitted (de Bruin & Yakut, 2018). Therefore a more ambitious tax is needed. The Climate Change Advisory Council (2018) recommends that we increase our carbon tax to €80 per tonne before 2030 in order to meet our emission targets and avoid penalties.

However the greatest problem with increasing our carbon tax in a high-income country like Ireland is that it disproportionately affects the poorest in society (Dorband et al, 2019). The ESRI (2018) has found that even a modest increase in the tax from €20 to €40 per tonne is regressive and affects the poorest the most. Therefore a €60 increase in the tax to €80 per tonne will only further exacerbate the regressive effects of this tax. The Climate Change Advisory Council (2018) also recognise this and recommend that "any increase in carbon taxation should be accompanied by measures to address energy poverty and reduce the negative impacts of carbon taxation on poorer households". This is where the implementation of a dividend system may help to counteract the regressive impact on lower-income households while also rewarding those who live low-carbon lifestyles.

The guarantee of a monthly dividend for every citizen in the country would provide a useful countermeasure for low-income households against the increased cost of petrol, diesel, heating oil or solid fuels. For those able to meet the increased costs with their pre-existing income, schemes could be set up to allow them borrow against their carbon dividend in order to invest in emission-reducing technologies such as electric vehicles, solar panels, domestic wind turbines or household insulation/retrofitting. Similarly this concept of borrowing against your carbon dividend could be widened further to enable citizens to invest in other things that are beneficial to society such as education (university, night courses etc.)



The dividends for citizens below the ages of 18 should be paid into a National Green Future Fund. This fund would be used to finance initiatives that aim at reducing our nation's carbon footprint for the benefit of Ireland's children's future. These initiatives may include electrifying public transport, retrofitting houses to improve efficiency, removing carbon from the atmosphere through reforestation initiatives or providing investment grants to Irish-based start-ups that are producing emission-reducing technologies. 6 years ago, the US State of California set up California Climate Investments (CCI) to manage the proceeds of its cap-and-trade system. The outcomes of which are listed below.

This tax would also send a powerful economic signal to businesses and encourage them to become more technologically innovative in their usage of carbon and substitute the use of fossil fuels and investing in new technologies. It would provide an air of predictability to the energy sector, something they currently lack – inhibiting long-term capital investment – therefore this policy will stimulate long pent-up investment in emission-reducing technologies.

Provisions must be made for the unbanked to receive their monthly dividend by cheque – the An Post's model of postal addresses for the homeless could be a model to pursue – prepaid credit cards may also work for those without bank accounts.

Levy on Single Use Plastics

Ógra is proposing to introduce a levy of 50 cents on single use plastics in order to discourage their use.

Single use-plastics are extremely damaging for the environment. The aim of this proposal is to encourage a move to recyclable packaging and materials, and a reduction in the amount of single use plastics being dumped, such as coffee cups, takeaway boxes, drinking straws, and disposable cutlery etc. The aim is to completely eradicate the use of single use plastics by introducing a financial incentive to stop people using plastics which are hard or impossible to recycle.

Ireland was a world leader in the introduction of the levy on plastic bags. The levy, which was first imposed in 2002, led to a overwhelming reduction in the use of plastic bags and generated millions which was used to support environmental projects. The United Kingdom have indicated recently that they will introduce a plastic tax which will see a levy placed on all packaging that does not include at least 30 per cent recycled material by 2022. Ireland should do likewise, and indeed this proposal would go further than the UK proposal as it calls for the introduction of a tax on all single use plastics, rather than just packing.

The 50 cent levy should be imposed directly on consumers at the point of purchase as if it is imposed on the manufacturers there is a chance that it will not be noticed by consumers as the manufactures might absorb the cost themselves so as not to give consumers any reason to call for a change in the packaging the company uses. It is envisaged that similar to the revenue raised from the levy on plastic bags, that the revenue generated by this levy would be used to support environmental projects such as funding the removal of plastics from our oceans etc.

However, we must also acknowledge the role manufacturers and retailers can play in reducing the use of single-use plastics. Many plastic packaging could be replaced particularly in relation to the packaging on fruit and vegetables, similar to what occurred with Easter eggs packages a number of years back. Ógra is calling for greater co-operation between government and manufacturers in reducing the amount of single-use plastics in circulation.





Research and Development

In a sentence : We need to use government policy to assist Ireland in becoming the silicon valley of engineering/scientific R and D for tackling climate change. If this can be achieved the benefits for the Irish state would be unquantifiable .

What we face is an incredibly complex issue that threatens the continued existence of the human race. At each stage of the development of the human race we have been greeted with insurmountable challenges and each time we have risen to meet them. As individuals ,companies and nation states.

Problem solving is what we do, and the problems we face now are on a scale that we have yet to tackle. The prospective been consider in this report/proposal is as follows. We face problems that can only be solved with innovation and that state policy must be the driving force behind nurturing and supporting this difficult and beneficial process . By the general nature of most great engineering and scientific endeavours they required/require state backing . But times have changed so the formula must as well , it is no longer feasible for governments to bankroll these projects/ventures in full , as with space travel (SpaceX , Blue Origin..) individuals and companies have the sufficient capital to fund these ventures (with state assistance). We want to have policy that attracts these ventures.

The goal is use government policy to make Ireland the hub for cutting edge science and engineering when it comes to tackling the engineering and physics problems that must be solved so that we can continue to persist on this planet.

Without going into to much detail there are three key category's that all problems can be sorted into. These problems solutions could come from almost every discipline. From computer science to botany . 1. Energy Capture/Electricity Generation/Fuel usage 2 2. Energy Storage 3. Energy Usage

Where Will The Solutions Come From?

The solutions will come from people. The problem is how do we get people to chose Ireland and then eventually develop the structures/institution/systems so that we can

- Research groups within universities or within industry (supported by government policies)
- SME's creating solutions to problems they face in new business ventures.
- By the very nature of cutting edge research , it isn't always clear where the break through will come from . A prime example of this is the development of the world wide web . This was an invention that came about due to the needs of the researchers at CERN "The web was originally conceived and developed to meet the demand for automated information-sharing between scientists in universities and institutes around the world." The positive economic and social impact of this one invention which was a consequence of cutting edge research cannot be quantified. There are many more examples (NASA, Los Alamos National Laboratory...)

Irrespective where the solutions come from , as long as they originate and are developed within Ireland that is all that matters .

Policy

1. Tax policy:

- Special treatment of income tax for researchers: This could be apply at the cooperate level or to the individual. This already exists in a similar form for companies with secondees. So wouldn't be very difficult to implement.
- Accelerated capital allowance for R and D/Engineering projects related to tackling climate change problems: An example would be : Have an accelerated capital allowance for projects related to finding fuel alternatives , researching new energy efficient building material.

2. Capital Expenditure: We need to have the infrastructure to support the economic activities need for change to occur (roads, power grid and internet infrastructure being the key ones that need to be in place to start)

- Transport Network : Must be upgraded so that people and material can move more easily as to support the setting up of new research centres and engineering hubs .
- National electricity transmission grid: Will have to be able to deal with the changing power demands of industry and the public. The development of new power generation methods will also more then likely lead to upgrades to the grid being carried out . An example would be facing the challenge of having the grid being supplied with energy from less predictable sources of energy such as wind and solar and the challenges that arise from this or having to deal with the introduction of nuclear fusion power plants (this is many years down the road). To quote eirgridgroup "The integration of more variable renewable forms of generation on the power system means transmission operators must consider an additional complex range of 5 demand and supply issues. These include the operational challenges of switching to more variable non-synchronous generation sources, security of supply in terms of managing an increasing variety of generation technology types and the integration and use of Smart Grid technologies allowing greater user participation in the power system."

3. Educational Programs: This ties into capital expenditure but hopefully private moneys will be used to . At first we will not have the skill base to fully tackle these challenges and with only Irish citizens so will need to implement

- Overhaul of education system
- Up skill
- Third Level funding : Third level institutions will be the driving force behind this revolution. To make this so , funding is required. Foreign direct investment and state backing will be needed.
- Second level funding : Funding of outreach programs , with the idea of getting more students into to STEM courses in college (there is an issue now with people being unprepared for STEM courses , which leads to high drop out rates. This is an issue that also needs to be addressed)

Cost

The goal is to have most of the money spent come from foreign direct investment. The money and will to fund these projects/ventures exists , we just need to attract that money to Ireland .

Working Towards Free Public Transport

Ógra proposes the phased-in introduction of free public transport by 2030. Free public transport is not something that should be considered for immediate policy implementation. Aside from the financial cuts, many problems exist within our public transport network.

At local city level, services are not being run efficiently. This is perhaps one of the biggest obstacles facing free public transport. Even at a hypothetical zero cost, an unreliable service is no good to commuters. Ógra calls for serious investment in public transport services across the country, to provide an alternative to car based travel.

An overhaul and rethink of our current school transport system is required. This system presents the first opportunity to encourage better travel behaviours of our young people while also reducing the need for car ownership of parents.

Ógra proposes that a daily cap of €7.50 be applied to students using public transport across the country during weekdays, with this being expanded to weekends overtime. We further propose that after 3 years, the cap be reduced to €5 per day and that a review should take place at this stage to determine the next steps.

Ógra proposes free public transport for Under 12's, with this being expanded to Under 18's within 3 years. In year 5 we propose the introduction of a commuter travel card, that would entitle commuters to the same daily cap as students.



Serious About Cycling

Cycling infrastructure in our towns and cities is seriously lacking. Dublin is ranked a poor 60th in a recent published Bicycle Cities Index for 2019. There are major concerns over cyclists safety on Irish roads. Ireland's cycling sector is in need of urgent reform. Ógra is proposing the appointment of a National Cycling Officer in the Dept of Transport, Tourism and Sport to promote and coordinate the development of cycling infrastructure across Ireland.

Ógra is proposing that funds be ringfenced at a local and national level for the maintenance and upgrading of cycle lanes across the country, particularly in cities.

Ógra further proposes that legislation being introduced to make cycling with ear-phones or other hearing impairing devices illegal. At present a law exists that if a garda considers that a cyclist is using a pedal cycle without reasonable consideration they would receive an on the spot fine of €40. This law is at the garda's discretion. Ógra is proposing to remove the discretion in cases where a cyclist is wearing ear-phones of similar devices.

At presents, cyclists are not permitted to turn left at a junction if the light is red. However, this is not the case in many European countries. Ógra is proposing to change the law to allow cyclists to turn left at red light junctions, but giving way to pedestrians who are using the green-man phase on the left-arm of the junction.

Ógra proposes the introduction of a university bike scheme similar to that of the city council bike scheme. This is to allow students the option to travel to and from university in a cost effective, eco-friendly and convenient manner. Off-campus student accommodation complexes would be required to install bicycle docking stations for students. CCTV installation at all docking stations should also be a requirement.

Ógra is proposing the lowering of VAT rates on bicycles and cycling equipment, to encourage the purchase and use of bicycles across the country, particularly for young people. In addition, Ógra is calling for the introduction of cycling safety training to be provided to primary and second level students.



Electric Vehicles & Alternative Propulsion Systems

There were **less than 4000 electric vehicles** on the road in Ireland at the start of 2018 .

The government has a target that electric vehicles will make up **10% of all vehicles** on the road by 2020 – that would mean about 230,000 electric vehicles on the road. Ireland has also set itself the target of ending the sale of cars powered just by fossil fuels by 2030.

In 2017 just **623 new electric cars** were registered in Ireland out of a total of 127,000 new cars, which is just **0.5%**. This was an increase from just 392 in 2016.

The popularity of Electric cars does not seem to be growing as much as the government hopes . This is probably because people are a bit concerned about limits on driving distances, initial purchase cost and the regularity/inconvenience (and potential cost) of charging the battery. Hydrogen powered vehicles though not commercially viable at the moment have serious potential in the near future to affect real change in the market.

Norway have a good track record of introducing electric cars into their car market, with **52% of all new cars purchased** in 2017 being electric.

A recent study by carzone.ie found that only 16% of Irish drivers would consider buying an electric car in the near future. Ógra proposes reviewing the current targets for electric cars, and proposes the introduction of a number of different subsidies and incentives to consumers to purchase electric cars, similar to that in Norway.

How they shape up:

Nissan Leaf dealers claim that driving 20,000 km in a Nissan Leaf fully electric car will only cost €200 in electricity. They base this on using night rate electricity. But swapping to a night rate tariff means that you pay more for your daytime electricity usage and a bigger standing charge . So – if the only night time electricity you are using is the car charger – then you might end up paying a lot more for household usage.

A typical **petrol car** would use 1400 litres to drive 20000km – and this would cost **€1960** over 12 months based on price of €1.40 per litre.

SEAI figures say that an *all electric* car driven 20,000km would use 3000 kWh of electricity. If all of this was at daytime rates (av 17c / kwh) it would cost **€515** in electricity.

If the home had a night saver meter and the car was charged on the night rate (av 8.4c / kWh) it would cost just **€254** in electricity.

So – compared to typical petrol costs – this is a saving of approx. **€1700per year**. **People who drive more than 20,000 km a year will save even more on fuel.**

A major issue in Ireland is that the majority of our electricity is generated by fossil fuels. As such, a simple change from petrol or diesel to electric would yield limited results. A broader transition to electricity generated from renewable sources is a key step in fulfilling the potential of electric vehicles.

Ógra proposes:

- That by 2030, electric vehicles would make up **20% of new cars sold** in Ireland. This would require an increase of 2% per annum over the next 10 years.
- That councils be given the discretion to **allow free on-street parking** for electric vehicles.
- That electric vehicles will be **exempt from toll charges** across Ireland.
- That electric cars will be **exempt from paying Motor Tax for first 5 years**.
- That a **reduced rate of VAT** be introduced for e-car purchases.
- An **increase in the grant** rate available for home charger to €800.
- An **increase in the grant available** for domestic and business customers by 25% and reduce incrementally for 5 years.
- **Delaying the introduction of charges of EV ports** until at least 5% of the national fleet is electric vehicles.
- The **introduction of a grant for homeowners** that require upgrade to their wiring in order to facilitate the installation of home chargers.
- That **petrol stations should be required as a planning condition to have 1 fast charger (50+kW)** for every 4 fossil fuel hoses, with the extra VAT cost to be Corporation Tax deductible over 5 years.
- That authorised motor dealers who achieve a target of 20% of their new Irish registrations in 100% electric vehicles by 2023 to **receive a rebate of €100+ VAT** per EV sold between 2019 and 2023.



Agriculture

Agriculture accounts for €24bn in revenue (31% of total revenue) to the Irish economy. Over two-thirds of land in Ireland is used for agricultural purposes.

Agriculture accounts for 30% of Ireland's greenhouse gas emissions. However, a recent EU study has shown that using a full life-cycle approach, Ireland's extensive grass-based systems produces the lowest GHG emissions in the EU for dairy animals and the fifth lowest for beef. In simple terms, to produce one litre of milk in Ireland produces less GHG emissions than to produce that same litre of milk anywhere else in Europe.

As demand for beef and dairy increases globally, that produce must be produced somewhere. It is reckless for anyone to assert that the national herd should be reduced, as doing so would create a shortfall in supply of beef and dairy which would need to be produced elsewhere, and at a much higher carbon cost. If the EU is to tackle climate action in a collective approach, this statistic suggests that they should look to increase dairy production in Ireland, while simultaneously reducing dairy production in less carbon efficient EU countries. We are not advocating the status quo – agriculture has definite environmental issues to resolve not least nitrate pollution of watercourses and methane emissions but we believe community engagement, incentives and reform are the way forward globally.



To illustrate the point, a displacement of 50% of current Irish beef exports to South America would result in a net increase of global emissions by between c. 3.6 Mt CO₂ per annum, equivalent to c. 20% of total current Irish agricultural emissions. ² The world's population is expected to exceed 9 billion people by 2050 with the UN Food and Agriculture Organisation predicting agriculture production increasing by 70% with enormous demand for commodities like beef and dairy from a growing global urban middle class. While Ireland's contribution to these markets might ultimately be small; for us as a global society to limit the environmental impact of this growth more of this production will have to be refocused on areas where it is environmentally prudent to do so. Diversification away from beef and dairy as suggested by the Oireachtas Joint Committee on Climate Action appears short sighted in my view. (McEvoy 2019)

Reducing carbon emissions on farms from a legislative perspective is difficult, as at all times we must remain vigilant of our food demands and also of the significant contribution of agriculture to our economy. As such, the best solution is to introduce farmers to carbon efficient farming practices.

A 2019 report by Teagasc suggests that Ireland's dairy sector can become more efficient by better farm management.

Teagasc estimates that every 10 day increase in the grazing season results in a 1.7% reduction in GHG's while also boosting profitability by €27/cow. Soil fertility plays a key role in this. Soil testing should be carried out regularly on farms to ensure that grasslands have the necessary levels of nutrients required, while also ensuring that pastures aren't over-fertilised, in particular with excess nitrogen. Nitrous oxide as a greenhouse gas has almost 300 times more global warming potential than CO₂. It is lost to the atmosphere from the breakdown of organic and chemical fertilisers. The higher proportion of fertiliser that is absorbed by plants, the lower the loss to the environment. This is why good soil management is essential on farms. Teagasc report that an increase in the use of clover in swards reduces the amounts of N fertiliser required.

Slurry management can also help to reduce the farms carbon footprint. Spring application of slurry reduces emissions due to the more favourable weather conditions at that time of year, while methane lost during storage is also reduced due to the shorter storage period. Teagasc research states that a 20% shift to spring application can reduce farm GHG's by 1.3%, while a shift to the trailing shoe method can reduce GHG's by 0.9%.

Better energy efficiency on farms, in particular dairy farms, will reduce both carbon emissions and energy costs. The installation of solar panels on farms to satisfy the energy needs of a farm can save the average dairy farmer €1,400 per annum.

A key element to reducing emissions on farms is research and development as proven by the research carried out to date. Ógra is proposing increasing funding for Teagasc Research and Innovation.



Forestry for Carbon Capture

Trees and forests capture carbon from the atmosphere during photosynthesis and as they grow, store carbon, in their trunks throughout their life cycle. As such, forests act as natural carbon sinks, with the removal of forests and the burning of wood for fuel contributing to increased carbon emissions through both the release of this carbon and the elimination of the capturing effect of the cut trees. Targets for worldwide increases in afforestation are part of the Paris Climate accords and the EU has targeted increased afforestation throughout the union as part of its own climate change policies.

As with all climate science, the science of the effect of afforestation on climate change is more complex than it first appears; with recent articles in high respected environmental science journals indicating that while afforestation certainly can sequester carbon, forests can contribute to global warming through the release of volatile organic compounds which contribute to global warming and through increasing the capacity of land to absorb heat from the sun (surface albedo) as well as the release of moisture into the air and cloud seeding effects, leading to lower heat absorption. However, it is estimated that the world's forests current act as a global carbon sink for approximately 2.4 Gt (gigatons) of carbon per year.

As such, careful policy decisions must be made about how Ireland utilizes afforestation in its climate change strategies. Even taking into account the complex variables involved in afforestation implementation, evidence indicates that forests could provide as much as 1/3 of the total CO₂ reductions needed worldwide by 2030 to keep global warming under 2°C. It has been estimated that deciduous forest stands can take in approximately 1-2 t/y CO₂. Ireland's carbon emissions in 2017 were estimated to be approximately 60.74 million tonnes.

Priorities

Ógra believes that the key questions in Irish forestry are the following:

- How much afforestation Ireland should target
- The kinds of forests that Ireland should aim to be developing
- The commercial usage of these forests and the priorities of the state in their management



Current Situation

Today, Ireland is approximately 10.5% forest (~ 745,456) and the forestry sector in Ireland, according to the Coillte website, employs about 12,000 people and contributes approximately €12 bn per year to the Irish economy. Coillte is the commercial, state-owned forestry business that manages commercial forestry on behalf of the Irish state, owning approximately 7% of the land in Ireland and 50% of all forest in the country. Coillte's estimate of its contribution to Ireland's carbon emissions targets is an annual equivalent of the removal of 1×10^6 tonnes of CO₂ or 1.8% of Ireland's total emissions. Afforestation is currently proceeding at a rate of 5,500 Ha/y, which is below the targets set out in the governments previous 2014-2020 plan and the current plan targets a rate of 8000 ha/y. This replanting is estimated to deliver an abatement of 21 MtCO₂eq between now and 2030. While Ógra welcomes a commitment from the government towards increasing total forest coverage and the rate of afforestation as part of their climate commitment plans issues still exist with regard to current forestry proposals.

One of the key issues in Irish forestry is the “near religious zeal” of deployment of Sitka Spruce as the tree of choice in Ireland forests, with only 2% of Ireland's forests representing broadleaved, deciduous trees (5). Furthermore, as many of the remaining deciduous forests are located on private land, the deforestation of Ireland's natural habitats is continuing with commercial interest in the harvesting of these trees for firewood becoming a push factor as the low calorific value of spruce makes it an unattractive source for home heating. The historical use of spruce trees has been driven by their rapid growth, making them an attractive prospect for commercial forestry however as the price of carbon as well as the cost to the exchequer of failures to meet climate targets increases the commercial benefits behind the choice of spruce for forestry should dwindle.

On a non-commercial level, issues arise with the use of fast growing Sitka forests for carbon capture, the nations ecosystem and climate change. Increased forest coverage of darker coniferous forests has been associated with increased contribution to global warming, due to the changes in surface albedo associated with the forests. Furthermore, the cutting down and use of these trees in wood pellet burning releases the stored carbon back into the atmosphere. Finally, if Ireland aims to dramatically increase its forest coverage with non-native tree species which damage local ecosystems, then the increase in forestry could in fact prove detrimental to Ireland's environment and wildlife, rather than beneficial – although it will still help the government meet its carbon targets.

Proposals

As such, Ógra calls for the following:

- A change in government funded forestry project priorities towards carbon capture instead of commercial felling.
- The planting of new forests to be undertaken using native broadleaf tree species with the aim of maximising the carbon sink capacities of new forests
- An evaluation of the benefits of forest felling in existing forests for commercial purposes against the maintenance of forests as carbon sinks.

Rewilding

Rewilding is the process of reversing historical intervention on land to its pre-human state either through direct intervention or withdrawal. It involves the filling in of drainage channels and removal of human infrastructure such as roads which is then followed by the replanting of native species of flora and reintroduction of long absent or locally extinct fauna. Rewilding can play an important part in the fight against climate change and loss of biodiversity through the sequestration of carbon, aiding flood prevention and through the enhancing of natural habitats and ecosystems. Previously Ireland has concentrated on commercial reforestation through Coillte as a means of creating economic value from former marginal agricultural land however this planting of conifer monoculture does little if anything to restore our biodiversity or drive value in other economic sectors such as eco-tourism.

While the state is currently in the process of rewilding its first area in the Nephin Beg range in North Mayo we are well behind the curve on a European level in recognising the benefits of rewilding in the climate change and biodiversity debate. Extensive European and NGO funding in the United Kingdom is seeing ambitious projects being rolled out in Scotland and in Wales with the Caledonian forest, Cairngorm connect project and Summit to Sea currently in the phase of execution. The effects of the Cairngorm project has seen the planting of native species of trees which has encouraged a flourishing biodiversity with the return of eagles and rare insects to the project area with future plans for the return of apex predators like the Eurasian lynx after an extensive stakeholder engagement.

Ógra is proposing that the Irish State put together a long term cross border rewilding strategy connecting some of our most valuable ecosystems such as our newly protected bogs, river basins and mountain pastures in a series of green corridors that have the potential to support and enhance the position of our own native biodiversity and arrest the decline of native species such as the fresh water mussel, red squirrel, hen harrier, Irish eel and bees and could pave way for future reintroduction of wild boar, lynx and further introduction of golden eagles and even future re-introduction of the Eurasian wolf in the long term. These green corridors could have a central part to play in contributing to Ireland's own carbon soakage, decline of biodiversity and flood prevention and provide a sustainable source of employment supporting the communities which they will border.

Working with landowners and with EU agricultural subsidies in mind – rewilding Ireland gives us a unique opportunity to redefine what exactly a custodian of the countryside means in the future.



Oceanic Wind Farms

Over the past few years we have witnessed numerous attempts at building wind farms in rural communities throughout Ireland. These plans have always been met with strong opposition and sometimes add years onto an already long process. Often these plans do not go through and are scrapped due to local opposition. Ógra are proposing that oceanic wind farms are a more appealing options.

Since 2014 the cost of oceanic turbines has gone down by 45%. This is due to a number of factors; the rise in competitive tendering, larger turbines and more capacity. Currently there are turbines with 6-10 MW capacity and 10-12 MW turbines in development. With the introduction of these turbines costs will continue to be reduced. The average cost of turbines is €2m per MW which is significantly lower than 2013's €4.4m per MW.

One key benefit of oceanic wind farms is the lack of a consultation process with locals. With regards to fishermen, who are one of the few groups who could complain, there is no basis for an argument against oceanic wind farms. They do not disturb the natural ocean life. Most recent studies indicate they are no more noticeable to fish life than a passing boat or stationary buoy.

Placement of these windfarms requires a very strategic approach. Placement of these farms near isolated island communities could provide the potential for job creation on those islands, with the same principle being applied for coastal communities around Ireland.

With major plans to increase the number of electric cars on the roads, one massive loophole exists in that these cars would be powered by electricity created from peat burning. As such, alternative and renewable energy sources are required and oceanic wind farms can do so in an efficient and environmentally friendly manner.



Bord na Móna

Just Transition is a key part of securing climate justice in Ireland. Given our country's long history with peat generated electricity and heat, a quick flip to renewable energies would put thousands of jobs at risk and would have detrimental effects on our communities. Bord na Móna announcement that it is to phase out peat production in the coming years is a welcome one from a climate action perspective, however the workers and the communities where the peat plants operate are being forgotten about.

The situation in Bord na Mona is neither normal nor routine. The programme of planned redundancies and other proposed changes has not arisen from everyday commercial operations or pressures. In reality, workers – and the Midlands communities - are now being required to sacrifice jobs and livelihoods in the cause of the greater common good and to help protect the local and global environment for future generations. Thus, they are being asked to shoulder quite a remarkable burden, on behalf of wider society. While climate change may present as a growing threat on the horizon for many, for the workers and communities, it is both very immediate and potentially very damaging, in terms of livelihoods, living standards and life prospects. This essential truth must be at the core of whatever Just Transition response we fashion and must inform the terms of the settlement put in place for Bord na Mona workers. It should not be utilised as an opportunity to drive down standards or secure a lowering of costs 'on the cheap'.

Ógra calls for the establishment of a Just Transition Commission with particular focus on Bord na Móna, similar to that which was set-up in Scotland in 2018. The commission would be tasked in the first instance with planning, investing and implementing a transition to environmentally and socially sustainable jobs for workers currently employed in the peat industry. The Commission should look at the outcome of the coal miners strike in Spain which has seen the Spanish government invest in rural communities affected by the mine closures.

Ógra is also proposing that a considerable area of cutaway bogs, especially in the Midlands, should be repurposed for eco-tourism and botanical restoration. This would work towards improving biodiversity while also providing jobs to Bord na Móna workers.





Nuclear Energy

Ireland's energy policy is focused on developing better ways to harness clean power from renewables and biomass. Yet this approach is failing to produce enough energy to satisfy the nation's power needs or electricity "baseload"; the daily minimum demand for power from the national grid.

For renewables to ever make a viable contribution to the Irish energy mix, policy makers will have to rethink how we provide the energy baseload to support renewables. Currently in lieu of economic and scalable storage, renewable energy needs to be 100% backed up by fossil fuelled thermo plants thereby locking in fossil fuel's dominance in the Irish energy mix for the future. This calls for a frank reinvestigation and debate of the viability and legality of nuclear power in Ireland as it's currently forbidden by the *Electricity Regulation Act (1999)*.

Opposition to nuclear energy can be seen in the successful anti-nuclear campaign mounted against the Fianna Fáil proposed nuclear installation construction at Carnsore Point, in Wexford in the late 1970s, and later in popular opposition to England's Sellafield reactor in the late 1990s. In response to the dropping of the Carnsore nuclear project, ESB set about constructing Moneypoint, the country's largest coal burning plant, which arguably had more of an adverse impact on the environment and on our greenhouse gas emissions than the Carnsore nuclear project ever would have. Moneypoint produces 21% of the national electricity supply and is due to come to the end of its operational life by 2025 when it could potentially be replaced by a nuclear installation given its pre-existing on-site and transmission infrastructure, proximity to the Shannon Estuary with its abundant water supply for cooling and location within the Shannon economic region.

The latest nuclear fission generation IV and small modular reactors (SMRs) are proving to be the safest, most efficient and cheapest solution on par with natural gas - they avoid the major drawbacks thanks to their modular design when compared to traditional fast breeder reactors which are prone to cost overruns and lengthy delays. With the exception of hydropower, nuclear is the only carbon neutral energy source capable of supporting renewables and deeply decarbonising our national energy grid which it turn can support the electrification of transport and home heating - a key component often omitted by Irish government policy but specifically modelled for as an immediate policy requirement by the EPA's TIMES energy model for decarbonisation. France, a major economic, manufacturing and agricultural powerhouse has some of the best air quality and energy security in the EU, thanks in no small part to its utilisation of nuclear energy which supplies France with 75% of its energy needs. The level of required decarbonisation is stark when modelled for by TIMES energy model - such is the size and importance of the agriculture industry that even if agriculture can achieve a 50% reduction in GHG emissions by 2050, the entire energy system must achieve a 95% reduction in CO2 to deliver an overall GHG emissions reduction of 80%. This can only be achieved through the construction of nuclear installations in Ireland.



It must also be noted that Ireland is already partly powered by nuclear power by way of electricity interconnectors between Wales and Scotland. In 2016 we sourced 7.6% of our power from the UK mainland. The UK itself is 21% powered by nuclear power (with huge plans to ramp up reactor construction) and is a net importer of French nuclear power itself. Ireland is arguably already powered at least 2% by nuclear energy. Only nuclear power can help Ireland lower its carbon emissions and regressive energy costs, while increasing air quality and energy security. A joint study last year by Harvard and MIT came to the conclusion that realising nuclear energy's potential will be essential to achieving a deeply decarbonised energy future in many regions of the world. A 2018 United Nations report – The Special Report on Global Warming of 1.5°C – modelled and called for substantial increases in the rollout of nuclear energy along with renewable energy, if we are to meet our international climate targets under the Paris Climate Accord of keeping temperature rises to below 1.5°C.

It is disappointing to see any mention of nuclear power negated by both the recent Citizen's Assembly and the current Oireachtas Joint Committee on Climate Action. Nuclear energy is enjoying something of a renaissance and growing popular support albeit from a very low base following the Fukushima incident and decision to close German nuclear installations. Leadership by States through deliberative democracy could be key to unlocking what is always a very emotional and sometimes irrational debate. Grassroots advocacy campaigns have had some success of late in national polls and regional referenda in the USA, mainland Europe and Asia. Interestingly pro-nuclear advocates used the emotional arguments based on the environment and climate change to win the argument convincingly. Civil society and youth political activism are slowly awakening to the fact that nuclear power has a serious role to play in the fight against climate change with the 2015 Young European Council recognising its role in decarbonising the European economy. Were California and Germany to invest the \$680 billion they invested into renewables into new nuclear power plants, they would both already be running 100% on clean energy. With thousands of qualified energy workers at the ESB's coal plant at Moneypoint and Bord Na Mona's peat burning stations in the Midlands facing an uncertain future; now is the time for strategic planning for our clean energy future. At the very least, the repeal of s.18 of the Electricity Regulation Act (1999) pertaining to the prohibition of nuclear energy in Ireland would allow us to engage in a robust conversation on Ireland's future energy mix. If nuclear power were not to be included in our energy mix in the future, we would be wasting our time and resources solving the unsolvable and engaging in mere tokenism.

