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Making Ireland a leader in climate change – the future of energy

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Introduction

Energy is at the heart of the climate change issue, with the bulk of global emissions associated with its production and use. Globally, meeting our climate change goals will require fundamental changes in energy systems, in particular moving to very high levels of energy efficiency and renewable energy. Ireland has made some good progress in these areas in recent years, but it still, like most countries, at the beginning of a long journey that will see very big changes in how all of us use energy and where this energy comes from.

Ireland emits more greenhouse gases per person than almost any other country in the EU. And so clearly more action is required, as is well recognized by policy makers and well set out in policy statements such as the new National Mitigation Plan. Other countries have already set very ambitious targets for the future, well beyond what is required by the EU. Denmark intends to be fossil fuel free by 2050. Germany intends to halve its energy use by that date. And where they lead others will follow.

What are the benefits of leadership?

Ireland can shift from reliance on other countries' energy to use of our own, clean sources. This will reduce air pollution in cities, enhance our competitiveness, and create jobs. Efficiency can make our homes healthier and cheaper to run. Energy efficiency means wasting less and getting more value from the energy we use. In some people's minds, it has a negative image of sacrifice – pictures of dark, cold rooms, or feeling guilty when using the car sometimes come to mind. But the fast pace of technology progress is changing that image. Energy efficiency was never about doing less, but about using less energy to do more. And now technology is giving us more control and convenience. This means our lives will be more comfortable and convenient, while also being less wasteful. And of course, Ireland is already good at inventing and making these kinds of technologies. This is where the jobs of a smart, sustainable future will be, and Ireland could become a leading player.

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Almost 90% of our energy comes in the form of fossil fuels imported from other countries. As well as a security risk, this represents a massive financial drain. Every single day, €12 million goes abroad to benefit other people's economies so that we can buy their fossil fuels, which we then use wastefully. Our energy import bill is half the size of our national education budget. Imagine if this money could stay in the Irish economy to support local clean energy sources, technologies and services.

A strong response now will also make us more resilient to the effects of climate change. It now seems impossible that we will avoid at least some degree of global climate change. And we already have glimpses of what that might look like - more frequent storms and hurricanes, more unpredictability in the weather. Homes, schools and hospitals that are better insulated, that use less energy, that are more sustainably built, will be more ready for this future.

Ireland has a strong image internationally of being green and clean, and also for high standards of technology and innovation. It also prides itself on its image of being a strong leader in issues of development and global justice. In the coming years, responding to climate change will test all of these attributes. Whether thinking in terms of tourism, inward investment, or simply our standing in the world, our claims to leadership and the benefits of that, will have to be earned.

What choices do we have for our energy future?

Leading with energy efficiency

There are many potential options for a low carbon future. All of them should involve the principle of 'energy efficiency first' – after all the cheapest, cleanest type of energy is the energy we don't use. We have an opportunity to greatly reduce our energy use through becoming less wasteful. Even with today's technologies, we could reduce our usage by as much as one third, simply by wasting less. Not by reducing our quality of life, but by becoming smarter and more efficient. Remember, none of us use energy for its own sake; we use it to benefit from warmth, or entertainment, or to travel or to work. We can achieve the same ends with far less energy.

In what kinds of ways can we become more efficient? First in our homes – we have become much better at building very efficient homes that waste a lot less energy. A new home built in Ireland today uses less than one third of the energy of the average Irish home, simply because modern windows, walls, heating systems are much more efficient than ever. It's now relatively straightforward to build a home that uses virtually no energy. An old home can be upgraded (often called 'retrofit') to improve insulation, heating, lighting etc, and energy usage can be dramatically reduced (easily more than halved, though such an upgrade can be expensive). All of these solutions and technologies are readily available now.

At the same time, new technologies are coming, particularly what are sometimes referred to as 'smart' or 'connected' devices. We all know what our smartphones can do now that wasn't even imaginable just a few years ago – we can access minute-by-minute weather forecasts, real

time bus and train information, maps and directions, and much more. You can now get heating controls that allow you to adjust the temperature separately in every single room, that you can turn off and on when you're not at home, that learn your habits and anticipate your needs. Your car can tell your house that you are almost home and thus the heating should be turned on. These kinds of innovations open up huge potentials for achieving great efficiency gains in ways that actually enhance convenience and comfort, not reduce it. Of course, sensitive issues of privacy and security arise, and must be dealt with carefully. This is the subject of much discussion and experience internationally that we can learn from.

Becoming more efficient brings many benefits, not least in reducing greenhouse gas emissions. Of course it also saves money, making a warm, comfortable home more affordable and making businesses more competitive. For an energy importer such as Ireland, an important benefit is reducing imports, and keeping money in the local economy. Think of upgrading the efficiency of homes – this is construction work, labour intensive, using local workers and companies. Thus the upgrade of homes means diverting money that previously went abroad to buy energy, and keeping it in the local economy to support jobs. Thousands of people are currently employed in the home energy upgrade sector in Ireland today.

Exploiting our clean energy sources

Even as Ireland becomes much more energy efficient, it will of course always need energy. We need to move quickly to greater use of our own clean resources. Today, the cheapest and most effective renewable sources are wind and solar. They are cheaper than ever, though they often still need some financial support to make them viable. Globally, in 2015, renewables surpassed coal to become the largest source of electricity capacity. Across the world, 30,000 solar panels are being installed *every single hour*. Wind is also growing strongly all across the world.

Wind energy has become a controversial issue in Ireland, with many people strongly against the idea of wind farms near their homes or communities. However, at a national level, wind farms are making a huge contribution to reducing Ireland's greenhouse gas emissions. Without wind energy, emissions from our electricity use would be over 20% higher, a saving of over three million tonnes per year. The capacity of Ireland's wind farms equates to solar panels on the roofs of one million houses. Wind is cheap and effective, but must be properly planned and managed, with strong emphasis on working with communities to involve them in decision-making, allay any concerns, and make sure they properly share in the benefits of such developments. That such practices have not always been followed is a great pity. While it is clear that wind energy is of significant benefit to Ireland as a whole, this does not mean that wind farms can be built anywhere or without proper local engagement, good planning, and community participation. Local issues need to be taken very seriously. We need to improve this issue or we will lose a very important resource for reducing emissions and reducing fossil fuel imports.

Solar energy has fallen dramatically in cost, and is now ready to make a much greater contribution to supplying in renewable energy in Ireland. It is the fastest growing renewable

source in the world, and Ireland should be making much more use of it. I would expect it to soon become the fastest growing renewable source in Ireland.

Other renewable energy sources of electricity are being developed, although they are still more expensive at present. This includes off-shore wind, tidal and wave energy. These are all of great interest to Ireland, given its large sea area with very rich clean energy resources – our stormy seas are full of energy we hope to harvest in the future.

Our electricity system is based on a national network of power stations delivering power to homes and businesses through a network of wires. However, it is becoming more common now to see local, decentralised approaches, where local energy supply meets local demand. Such approaches are becoming much more common, principally using solar energy. In parts of Australia, for instance, as much as a quarter of all homes now have solar panels on their roofs.

This can allow people to take control of their own energy – to generate what they need and even sell the excess. However, this throws up an issue that must be debated – local ‘micro’ generation tends to be more expensive. Paying people for power from their rooftop solar systems may end up adding to the electricity price of other users – this has happened in other countries. On the other hand, decentralized micro-generation opens up exciting possibilities for local supply, benefitting local communities, and quite a different way of providing energy in the future.

I have dwelt so far on clean sources of electricity, but of course there are many other types of energy other than electricity. We tend to categorise these as for heat (in homes, offices, factories) or transport. The main option for both is what is called bioenergy – energy from plants or waste materials. This includes wood, something that Ireland has plenty of. Of course many of us are familiar with using wood in home fires, which is nice and comforting but not very efficient (in an old fashioned open fire, most of the energy disappears up the chimney). Modern systems use closed stoves or boilers, very efficiently burning wood chips or wood pellets (wood dried and processed into small pellets). These are efficient and good value, and becoming quite common in Ireland. We also make some use of biofuels, i.e. the equivalents of petrol or diesel but made from plants, and hence lower emitters of greenhouse gases. Such types of energy may fit well with Ireland’s agriculture sector, though there are concerns about using land for energy crops if it displaces food growing. As well as using bioenergy for heat and transport, it is also possible to use electricity, where progress on renewables is being made more quickly. Hence electric cars and advanced electric heating systems may be part of a sustainable future.

It is important to note that even when we shift to using more clean energy sources, we should still be driven by the principle of energy efficiency first. Clean energy sources cost money, require raw materials such as steel for wind turbines, or silicon for solar panels, or take up land area, as is the case for bioenergy in particular. It will always be better to start with considering ways to reduce the amount of energy we need.

As this discussion shows, there are many choices society should consider in charting a path to decarbonisation. All options have advantages and disadvantages, and some bring different kinds of benefits. For example, large renewable energy projects will tend to be cheaper than many small ones, but may bring few local benefits. As mentioned, paying individuals to sell renewable power from their homes or farms brings benefits, but may lead to increased energy prices. Another example is bioenergy. As we increase our use of wood as a renewable fuel, a choice is to be made between local or imported fuels. Probably the cheapest option is to import bulk quantities of wood fuel, but this brings little local benefit to foresters or harvesters. It is important to be transparent about these kinds of trade-offs.

What does a more sustainable future look like?

The pace of technology change makes it hard to predict how different our lives will be when we move to more efficient and cleaner energy systems. I suspect our homes will look much the same, just warmer and brighter and, behind the scenes, using no energy and made from more sustainable materials. They will more 'high-tech' and we will have more control and more information. We may still be travelling by car in 30 years, but they will look different, probably more use of smaller cars for local trips, almost certainly powered by electricity.

More widely, we will probably be changing how we design our cities – in favour of more local, shared areas of living and working rather than the current pattern of long commutes between home and work. Our cities and towns will also be altered by the negative changes climate change will inevitably bring. This can bring other social benefits and improve quality of life. Also, we already see many Irish cities and towns having to adapt to more flooding, stronger storms and other tastes of the future. All the more reason to build homes and neighbourhoods that are resilient and ready for the future.

How do we get there?

In some ways it is relatively easy to describe what a perfect, low-carbon society might look like in the future. It is harder to describe how to get there. In fact, focusing on all of the massive changes that will be required can be so daunting as to make it impossible to imagine getting there. For this reason, I think it is sometimes wrong to focus all the time on the ultimate end point, rather than talking more about the first steps we should be taking now. I believe that the most valuable thing we can do now is to take real, progressive steps forward. Even if such steps are only the beginning, they make real, visible progress that builds support, enhances our reputation, and allows us to move on to the next actions more easily.

There is no shortage of solutions available now to help the transition. The problem is in getting them used more. We already know how to build a house that uses virtually no energy, or even that produces more than it uses. When starting from scratch, it isn't much more expensive than building a conventional house, and saves a lot more over its lifetime. Upgrading existing homes to very efficient levels can certainly be done, though it is not cheap. Home energy upgrades is a

thriving sector – we all know friends, family of neighbours who have invested in this in recent years. Mostly, the upgrades have been relatively light, and we need to go much deeper in the future. Three quarters of homes standing today will still be with us in 2050, and so making them much lower emitters of greenhouse gases must be part of our strategy.

It goes without saying that anything we build now should be ready for the future, which means very high levels of both efficiency and renewables. Our homes, our schools, our offices, our towns and communities as a whole. We should be accelerating our greater use of renewables in all sectors, and we should exploit all options.

For transport, most attention is now given to electric vehicles. This is for good reason – electric cars are becoming more widely available and cheaper and could be a great way to make the transport sector more sustainable.

Of course, the ultimate goal is to stop using fossil fuels altogether. It is worth noting, however, that opinions differ greatly as to how quickly this needs to be done. There is a tendency to assume that we must focus on eliminating all fossil fuels immediately. However, unless global policy changes radically, they will still be with us for many decades, especially in parts of the world that are still growing their energy systems and focused on ensuring all their citizens enjoy the benefits of full energy access. IEA modelling shows that it is possible to be on course for a two degree warming target with still one third of global energy coming from fossil fuels in 2060. This depends on the overall strategy for reducing emissions, including from other sectors such as agriculture. We must decide where to place most of the effort to reduce emissions, and where to allow for a slower transition.

Achieving our ambition – policy and people

In aiming to accelerate action on reducing emissions, there is no simple answer to the question what policies are required. Actually, there is one simple answer: all of them. All sectors of society, all categories of policy are relevant: taxation, regulation, planning, housing, education, health, transport, agriculture, many more, and of course energy. This is one of the challenges to becoming a leader: it isn't a question of taking the one big action or decision, but rather many small, separate actions across all government departments and all sectors of society.

Ireland's National Mitigation Plan describes itself as a first step in changing Ireland from a high to a low emitter of greenhouse gases. In its scope it reminds us of the size and complexity of this mission. While all of the specific policy items are welcome and worthwhile, the most important ingredient will be commitment: success depends on a sense of seriousness and prioritisation across society. This then must permeate into all areas of policy making so that pro-climate decisions are made in all domains. This most of all applies to any decisions that will "lock in" future emissions or unsustainability. For instance, if we build buildings that are not very low or zero emissions, those emissions will continue for several decades. Equally, when

building new transport infrastructure, we should be fully aware of the long-term emissions implications. This is a realignment of all future actions towards low carbon options.

Coupled with such a realignment is a focus on how to address our existing stock of carbon emitting 'things' such as already-built buildings or existing industries and transport infrastructure. These require intensive programmes and campaigns to encourage (or even obligate) actions and investment, supported by advice and probably also some financial support. Upgrading your home, for instance, needs to be made easy, affordable and desirable. People need trustworthy advice on what actions to take, ways to know what solutions and what contractors to choose, and the confidence and motivation to act. In my view, strong upgrades of large numbers of homes will only happen with the support of public funds.

In order to avoid the risk of being overwhelmed by the enormity of the task, it is important to start with some clear, concrete and visible actions. Such actions should be high profile and ambitious, and so can show Ireland as a country willing to show leadership in real, meaningful ways. Some of the areas that occur to me as potential early actions include electric cars; energy efficiency in public buildings; and accelerating progress on renewables in all sectors. Each could be the subject of a strong, cross-cutting policy campaign to drive fast action. It will take the injection of both money and human resources, and require genuine joined up thinking and action across many government departments. This in turn requires leadership.

Much of this change will require investment. Some of this will come from Government, some from individuals, and certainly much will come from financial institutions and investors. Obviously, the more investment that comes from the private sector the better for avoiding pressure on the tax payer, and so a strong role for government is to make investment easy and attractive.

One key constraint in any government is the number of policy makers and administrators assigned to a task or policy area. There is so much thinking and planning to be done, that different issues end up in a queue for policy makers' attention. It is not a high profile issue, but in my experience it is a key one. If we want to make more policies, more campaigns, more new initiatives, we will need more people working on it. A simple starting point would be to do this visibly and demonstrate that Ireland is serious about this issue, and is applying the appropriate level of resources to it.

What is the role for each of us as individuals?

Of course, there are many aspects of how we live our lives that have a great impact on our greenhouse gas emissions. How we heat our homes, how we travel around, what we eat – we all can, and should, consider our own 'carbon footprint' and how to reduce it. However, I believe it would be wrong to focus entirely on the behaviour of individuals and what changes each of may make. Firstly, I don't think it is realistic to expect that everyone will be able to spend all day reflecting on their behaviours and remember to 'do the right thing' in a way that

requires constant thought and effort. Also, I don't support the framing of the issue as one of good or bad behaviour, or 'guilt' over how we live our lives. And even if we were to all suddenly decide to change the way we live, this would add up to far less than the overall changes we need to drive as a society.

Much more important are the decisions we make and the actions we take together as a country. Together all of us decide Ireland's climate impact, through what we say to our politicians, through how we vote, through how we react to specific proposals. Our elected politicians are responsive to their voters, and this sets the national agenda.

And as we make societal choices we must remember that we are choosing between different options, all with pros and cons. We are not in a position to say no to everything – doing nothing is just not an option. Too often, we look at any particular issue in isolation, which can tempt us to reject us if it has some costs or downsides. But if we reject one policy or action, then what will we do instead to reduce our emissions? Possibly an Assembly such as this is a great opportunity to say what our overall preferences are. How ambitious do we want to be? Are there certain actions we prefer? Are there certain technologies we don't prefer? Some 'guiding principles' would help everyone put subsequent actions and proposals in a broad, strategic context.

Reading the many submissions to the Citizens' Assembly, it is striking how many people chose to go to the effort of making a submission simply to express their grave concern about climate change and their desire to see Ireland take action and show leadership. There is clearly an appetite in Irish society for this issue to be prioritised. If that appetite and that energy can be harnessed and focused on concrete, tangible actions, then there is no reason why Ireland should not become a leader in tackling climate change.