

Securing Ireland's future energy supply



A round table hosted by





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The Energy Institute brought together representatives from across the energy sector to discuss aspects of Ireland's energy security in the context of the Climate Action Plan 2021 (CAP21).

What is the main challenge to Ireland's energy security?

Siobhán McHugh

Energy security means maintaining energy supply for the economy and our daily lives. The biggest challenge is our exposure to the external fossil fuel markets. We don't have a huge amount of indigenous energy. Looking across electricity, heat and transport, we are hugely exposed to the gas and oil markets. The answer is further utilising indigenous fuel sources such as wind and solar and diversifying supply.

Peter O'Shea

Security of supply needs to consider broader energy requirements though the focus is inclined to be on electricity. In my mind there are short, medium and long-term considerations. Short-term and medium term it is a system operation and regulation issue and long-term it is a policy issue. The renewables target of 70 per cent in CAP19 and 80 per cent in CAP21 for renewable electricity by 2030 are achievable but challenging especially from a security of supply perspective. The key challenge is to ensure back-up for renewables. The primary focus is on the 70 to 80 per cent renewables by

2030 but it is securing the other 20 to 30 per cent and ensuring adequate backup that makes that target work. The challenge is to take a holistic view of the energy system in its totality.

Tom O'Brien

Listening to Peter made me think of the old saying, 'No one person can whistle a symphony, it takes a whole orchestra to play one'. For the foreseeable future we will need gas as well as renewables to meet our energy requirements. Our energy mix needs to be reliable, affordable and sustainable. In recent years the focus has been on sustainability and Ireland's over-reliance on fossil fuels. Now, unfortunately the reliability and affordability of our energy system is being called into question. That's damaging for the country's reputation, particularly in regard to attracting foreign direct investment.

Due to the current energy crises, we are starting to have a conversation about Ireland's energy security. Candidly, a lot of the issues we are encountering now is because we have never really had

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"The electricity system is changing fundamentally. We are going to have more renewables – there is an intermittency challenge but it's been proven to be manageable – and a more decentralised system."

Siobhán McHugh

this conversation in Ireland in the past. The Government, for example, has made serious energy policy decisions, such as banning domestic gas exploration or coming out against LNG infrastructure, before they have carried out any sort of energy security review or developed any sort of coherent energy security policy. Instead, we are pursuing policies that make us 100 per cent reliant on international gas supplies – the very gas we will need to provide the base load support for our growing renewables sector.

Paul Deane

I'm more worried about the electricity system, which is fundamentally important to wider energy security, as it cuts across the whole energy system – without it you can't operate filling stations and we can't heat our homes. Part of the work in UCC is looking at 80 per cent renewable electricity. It's the best route to reducing our emissions but it does not negate the need for fossil fuel plants. We need to build around 2,000MW of flexible gas-fired generation in Ireland over the next 10 years. I'm concerned about the ability of the market to incentivise that at the moment.

From an environmental perspective, it may seem counter-intuitive that we need to build more gas-fired thermal capacity but it will be used a lot less. Looking at CAP21, our reliance on natural gas in the primary energy mix will reduce from 40 to 25 per cent. There is no appetite to build new thermal plant at the moment. We need that extra thermal capacity to meet our renewable targets: that is the challenge.

Colm McCarthy

The centrality of electricity is important. 30 years ago ESB drove

The participants



Paul Deane is an Energy Researcher at University College Cork. His work focuses on the future and how we will heat our homes, fuel our cars, use our land and generate electricity. Paul has been involved in the energy industry for approximately 15 years in both commercial and academic research and tries to understand the transition to low carbon energy systems from a technical, societal and an economic perspective. He uses computer modelling tools like PLEXOS and TIMES to simulate what different futures might look like.



Colm McCarthy is an economist who lectures in the School of Economics in University College Dublin. He chaired The Special Group on Public Service Numbers and Expenditure Programmes reporting to the Government during the Financial crisis in 2009. Prior to working in UCD he worked for the Central Bank of Ireland, and the ESRI. He was previously on the boards of ESB and Bord Gáis Éireann. He is a regular contributor in the media on economics.



Siobhán McHugh is Chief Executive Officer of the Demand Response Association of Ireland, representing 600MW of demand and embedded generation response operating in the energy, capacity and DS3 (system services) markets on the island of Ireland. Siobhán has over 15 years' energy sector experience, having worked for Aryzta, the Commission for Regulation of Utilities, the Single Electricity Market Operator and EirGrid. Most recently, she worked for management consultants EY, focused on energy strategy, transformation, and major programme delivery.



Tom O'Brien is Managing Director of Nephin Energy, Ireland's largest domestic producer of natural gas. He has over 20 years' experience in the energy industry including over 10 years in the projects and energy department of one of Ireland's leading law firms. Since then, Tom has held senior executive roles at a number of Irish companies, including two Irish Plc's. Tom is a regular contributor to energy policy debate in Ireland. He holds an LLB from University College Cork, an LLM from University College London and a Diploma in Finance from University College Dublin.



Peter O'Shea is Head of Corporate and Regulatory Affairs at ESB. He is Chair of the Electricity Association of Ireland and served as President of the British Irish Chamber of Commerce in 2020 and remains on the Board. Before joining ESB in 1999, Peter spent 12 years working with the CEBG and National Grid Company in the UK in a variety of commercial and technical roles.



“There is an expectation that the energy transition will be linear but transitions tend to be lumpy. What we are seeing now are some of those lumps coming through.”

Peter O'Shea

energy policy; it was a vertically integrated monopoly. It kind of worked and it produced a reliable electricity system.

That system has now been – unavoidably – dismembered.

There is also a tendency in Ireland to confuse targets with policies. Targets also tend to be changeable and it's not linear in terms of the cost curve. Once you go beyond 60 per cent it gets increasingly costly – there is a perception that it is costless but it's not. We now face a huge bill for gas-fired plant and a lot of high-voltage lines, which we have to do. We need a more coherent policy and not just targets.

How do we ensure the electricity grid can meet the needs of citizens and businesses? What role will microgeneration/community energy play?

Peter O'Shea

The electricity system is big and complex. For security of supply you

need a secure generation system, with secure fuel sources and secure transmission and distribution systems. The policies for each of those individual parts of the system are clear. In generation policy it is to replace fossil fuels with renewable sources in a sensible and pragmatic way towards the 80 per cent target by 2030 and further beyond that date. There is an expectation that the energy transition will be linear, but transitions tend to be lumpy. What we are seeing now are some of those lumps coming through.

We have to now focus on the security of the generation and fuel elements of the system. Fuel diversity has been an important characteristic of the Irish system historically and we need to factor in the reduced diversity which is now coming at us. What does that mean for security of supply? In relation to natural gas, while I'm not sure about the long-term future of natural gas, it is essential to securing the electricity system at least to 2030 and in the longer term but non-emissions gas – such as hydrogen – will have a major role. We also need to ensure that the consumer becomes part of the transition.

Siobhán McHugh

The electricity system is changing fundamentally. The traditional energy model involved large generators transporting power through the wires to my house, my business and my community. We are going to have more renewables – there is an intermittency challenge but it's been proven to be manageable – and a more decentralised system. We will generate more power at the distribution level with solar and small-scale wind, interacting with batteries and demand side response – a whole new power eco-system. The new system will need to be much more flexible and we will see the rise of the prosumer, with their electric vehicles, roof top solar panels and heat pumps. We will need to put the active customer at the centre and ensure policy and regulation frameworks support that move to a whole new system.

Paul Deane

We have to invest. The technologies are there, the willingness is there and the ambition is there. But being ambitious is not a strategy. That ambition needs to have a clear strategy and money on the table. The investment needed to achieve the emissions reduction targets set out by the Government is around €45 billion of additional costs between now and 2030. That is additional costs, the gross costs are much higher and includes the costs that we need to incur even if there was no climate crisis. The challenge politically and socially is where does that money come from? And who pays for it? The bulk of the €45 billion will be on the demand side which means that it will be families and small businesses who have to make those commitments. Very few people on an average industrial wage are going to have the money to buy an electric vehicle, install a heat pump or fully insulate their homes. That's a big challenge for government.

Colm McCarthy

One version of the Atlantic wind resource is that Ireland is going to be the Saudi Arabia of wind. Firstly, it's not unique. We are not the only country with an Atlantic coast. The North Sea is also a good wind resource and it's shallower, making offshore winds farms cheaper than off the west coast of Ireland. There is also a presumption that the cost of bringing offshore wind

onto the system will be postalised onto all consumers – that approach should now be questioned. If you go out into the mid-Atlantic and catch some fish, the government doesn't come along in a boat and offer to bring those fish to the Paris fish market for you. Secondly, there is a tendency to be very optimistic about timescales. We have not built very many new high voltage transmission lines over the last 10 to 15 years. For example, the North-South interconnector was decreed to need substantial investment 15 years ago and it has gone nowhere.

Tom O'Brien

The planning system is one of the biggest challenges we have if we want to upgrade our electricity grid. It's one thing to have the money to invest but will you get what you want done through the current planning system in any sort of efficient way? Looking across a range of industries, this is a really tough country to get anything largescale done and that's because of our planning system. It will be a huge challenge to get the investment deployed for the energy transition if we don't address the planning system.

What is the future role of natural gas infrastructure in ensuring energy security?

Tom O'Brien

We should start by making the best use of what infrastructure we have. Gas Networks Ireland is looking to repurpose the gas network to take renewable gas and hydrogen. We are only one of three European countries that doesn't have a renewable gas scheme and yet we have one of the best agri-feedstocks in Europe. We still have no hydrogen strategy or CCS policy. We are behind the curve in these areas, relative to the rest of Europe.

At Corrib we have a piece of infrastructure on the west coast of Ireland that was built at a cost of €3.6 billion. Along with the national grid it is perhaps one of the most important pieces of energy infrastructure we have in the country. We can produce gas that has four to 13 times less carbon intensity than foreign imported gas. My 10-year-old daughter knows that if you



"Everything follows from a carbon tax; you don't need to give the good guys subsidies if you put sufficient taxes on the bad guys."

Colm McCarthy

want to lower your carbon footprint, you buy your strawberries from Wexford, not from Cyprus. The same rule should apply to our gas supplies. Yet in Ireland we have decided to import our gas via the UK from Russia and Qatar, instead of trying to use local production. This is not the right thing to do for the climate, never mind our energy security.

So, we are left in a curious situation. On the one hand the government admits we need more gas-fired power generation to ensure continued security of electricity supply. Yet on the other, the government is choosing to put our energy security at risk by relying solely on post-Brexit Britain for the gas supply necessary for that generation.

Looking at Corrib, we are excited about the potential for repurposing the infrastructure in the future. We already have a gas grid connection and we are on the doorstep of a huge wind resource in the West Atlantic. We see a potential future for blue or green hydrogen, CCS and offshore wind. In the meantime, our bread and butter will be providing cheaper, more reliable,

lower carbon intensive gas than whatever gas can be imported across the interconnector from Britain. There are existing exploration licenses around Corrib that undoubtedly have gas. With the right regulatory support Corrib could continue to play a really positive role for the country by providing the critical base load support our country needs while our energy systems transition to a net zero future. So long as we need natural gas we should be trying to use domestic production and use our existing infrastructure. It makes sense, both for the climate and our energy security.

Peter O'Shea

In the short and medium terms there is no question that natural gas is critical to system security. Looking longer-term, that is more difficult if we are to set a net zero strategy as gas is a carbon fuel and will need to be replaced by "non-emissions" gases. Looking at future options for non-emission gases, we see green hydrogen produced using renewable electricity to electrolyse water as a



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Tom O'Brien

really important option to help decarbonise the last 20-30 per cent of the electricity system by displacing fossil natural gas. Green hydrogen could also potentially provide storage options and the basis for system backup when the wind doesn't blow or the sun doesn't shine and it holds out potential to decarbonise those parts of the system which electrification cannot reach. We can also produce hydrogen from steam reforming of natural gas but that requires effective CCS, which itself has challenges to ensure we don't get carbon leakage. The other non-emissions gas is biogas, this could make up to 10 per cent of the current gas network capacity with biomethane – generally, as a rule of thumb, any fuel which is prefixed by “bio” will be scarce in volume and we need to ensure that such fuels are focussed on the hard to decarbonise areas.

Colm McCarthy

It was unfortunate in 1990 that we set national limits for emissions as we have an integrated world. If there is some gas in a hole of the west coast and the pipes are in place, if we don't use that

gas and do nothing on the demand side, then gas will come from elsewhere. The same argument applies to dairy farming. If you do nothing to influence the worldwide demand for dairy products then other countries, less suited, will produce those products. It brings us back to the economists favoured approach; tax consumption.

On the decarbonisation of the last 20 per cent of the electricity system, it now looks like there will be smaller scale nuclear technology, 300 to 400MW, available in 10 years. Nuclear will probably now come into the mix.

Paul Deane

I'm not a fan of nuclear but I'm also not a fan of climate change. We need to be open to all options, even those we might not like. Smaller nuclear is probably 10 to 15 years away and I can't see it becoming commercially available for some time. My neighbour can't get planning for a garage, so getting planning for a 400MW nuclear reactor might be difficult.

One of my colleagues in UCC surveys

the students each year and about 80 to 90 per cent are very much in favour of talking about nuclear as an option. The social memory has faded since Chernobyl and they are willing to look at these technologies. Trust will be the challenge in Ireland. We should consider nuclear but it shouldn't stop what we are currently doing.

We have an incredible gas infrastructure in Ireland. It has been very reliable, with no major outages. We have a reliable and robust system that can flex to accommodate weather and demand changes. It is a very undervalued resource and we need to consider how we use that resource in the future by using zero carbon gases. In the short and medium terms the future of gas is very clear, although it will drop from 40 to 25 per cent of the primary energy mix. As the electricity system decarbonises, in the non-electricity sector gas will become more important. Our gas infrastructure is relatively modern and is suitable to take hydrogen molecules in the future. Biomethane will play a small but important role at around 5 to 10 TWh.

What are the critical renewable energy technologies in ensuring energy security?

Siobhán McHugh

Electricity has a well-defined path to decarbonisation with the pace of development and the planning system being the main challenges. We will see increased use of proven renewable technologies such as wind and solar and that will make the system more resilient in the future. We then need to back up with storage, demand flexibility and interconnection. We also need to further develop those flexible technologies for grid stability. For heat and transport, we are still very reliant on fossil fuels. We need to electrify heat and transport where it makes sense and what we can't electrify we need to diversify into things like biofuels, geothermal and district heating using waste heat.

Peter O'Shea

Ultimately it is not about renewables, it is about emissions. If you look at Ireland's emissions, one third come from agriculture and the other two thirds is split fairly evenly between electricity generation, heat and

transport. If we decarbonise electricity and then electrify the other sectors as much as possible, that will deal with up to 60 per cent of Ireland's emissions challenge. We need to look to those proven renewable technologies in electricity generation such as wind and solar. Batteries will also be a major part of electricity and the future of transport, while heat pumps are important and offer a lot of potential not just in our homes but on a larger industrial scale also. The technologies are still evolving, with the learning rate on batteries still 20 per cent each year, with wind and solar a little lower.

Paul Deane

I take a broader perspective. It's not just about producing energy from renewables but also about saving energy to reduce emissions. We have to retrofit 75,000 homes per annum from 2025 and people are the big issue here. We need many more plumbers, carpenters and electricians. The Expert Group of Future Skills reckons we need another 30,000 skilled trades people in the next five years. In Ireland we produce too many programmers and not enough plumbers. These skills are needed to deliver those energy savings we need. We need that human capital to deliver out climate ambitions.

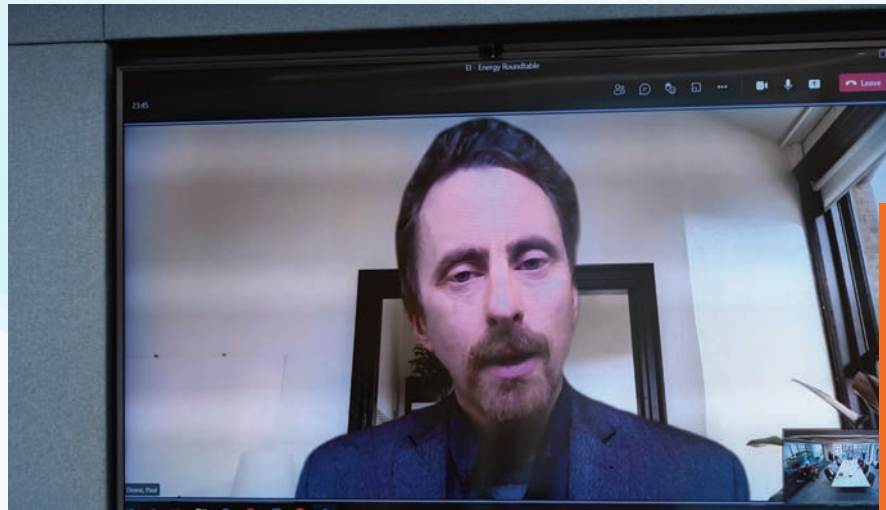
What one thing would help us achieve zero carbon and have a secure energy supply?

Siobhán McHugh

How we use energy is changing to a more distributed model and no matter what the source of generation, demand is always there. Traditionally, we have sought to flex generation to meet demand but by also flexing demand we can balance the power system more efficiently. To harness this demand side flexibility we need coherent policy, legislation, regulation and market rules for what remains an untapped resource. Looking at the wider energy system, the pace of delivery is crucial. The quicker we implement change the more benefit we will get in terms of emissions reduction over time.

Peter O'Shea

The Government's energy security of supply review, currently underway, is of national importance and should



"We have to invest. The technologies are there, the willingness is there and the ambition is there. But being ambitious is not a strategy." **Paul Deane**

address how we back up renewables. We did some analysis that showed if the wind doesn't blow or the sun doesn't shine for one day and we had to store electricity for that one day we would need 60 new Turlough Hills around the country or 10 million Tesla Powerwall batteries in our homes. It's just one example of the challenge we face and hopefully the Government's review will bring the joined up thinking which to ensure security of supply into the longer terms.

Paul Deane

We need long-term, stable, clear unambiguous policy right across the board – not just climate and energy policy but also planning policy. The industry and investors crave nothing more than certainty. We have just had Equinor walk away from investing in offshore wind in Ireland because of planning uncertainty. We need to give investors that certainty to achieve our energy transition.

Colm McCarthy

Carbon taxes. The world took a wrong turn 30 years ago with quantitative targets and trying to plan the economy in detail [in terms of emissions]. Dieter Helm from Oxford University commented that if this approach worked the Soviet Union would have

been a success. Prices are what economists turn to when you want resource allocation. Make something more expensive and demand will reduce. Everything follows from a carbon tax; you don't need to give the good guys subsidies if you put sufficient taxes on the bad guys.

Tom O'Brien

We need an honest and open conversation about how we are going to meet our growing energy needs. The conversation needs to be grounded in facts not driven by ideology. That is the best way of enabling the energy transition, because if we start having blackouts then support for the transition itself will be impacted. That conversation should hopefully lead to a cohesive, joined-up energy security policy. We then have to resource the relevant regulatory and permitting authorities appropriately to implement that policy. To date we have a poor record of doing that in this country. Finally, it's all about planning, planning and planning. If we don't address the planning system, then we have no chance of achieving what we want to. If we don't get these three elements right, then we have no chance of achieving the energy transition at the pace we need to.

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