

National Energy Research and Policy Conference

Achieving Sustainable Energy Security

Questions & Answers Follow-up

Session 1 Connecting Research and Policy

Cathal Ó'Cléirigh

Q: Is there a breakdown of the percentage of indigenous renewable purchased by Irish Electricity Supplier by company excluding GO Certificates? I would like to encourage the company that buys the most. Go Certificates muddy the information pool. We want customers to buy from companies that encourage the Production of indigenous wind, solar and hydro power. And yes I have looked at the CRU's Fuel-Mix-Disclosure-and-CO2-Emissions-2021.pdf The fuel Mix disclosure document is not fit for purpose as it cites most electricity providers claiming to 100 percent renewable electricity (by purchasing Go Certs).

A: Unfortunately, I am not aware of data that shows the sources of electricity purchased by suppliers excluding guarantees of origin. SEAI's statistics relating to electricity are based on fuel consumption and energy output of generators and autoproducers located in Ireland, along with the quantities of electricity imports and exports. We gather data directly from generators, autoproducers and the transmission system operator. We do not collect data from electricity suppliers on the source of their electricity. As per EU legislation and guidance, guarantees of origin have no impact on national energy statistics (see National Energy Balance | Key Publications | SEAI for more information).

Q: For individual households has any research cost benefit analysis been done on the possibility of it been more cost effective for households to go off grid? with Solar/Battery

A: Unfortunately, SEAI Energy Statistics is not aware of any research that has been done on the cost effectiveness of operating a household off-grid in an Irish context.

Q: How do we shift the focus on 'electrifying everything' to decarbonising electricity, our electricity is not renewable and depends on these same imports. Every sector is looking to electrify.

A: I think that the focus, as it needs to be, is on improving energy efficiency across all sectors of the economy, development of new sources of renewable energy and the deployment of technologies that can make use of that renewable energy. This includes retrofitting homes, improving public transport, helping businesses improve their energy efficiency, installing more wind and solar generation, and supporting the roll-out of heat pumps and EVs. The renewable energy share in electricity (RES-E) was 38.6% in 2022 (provisional value), while the latest Climate Action Plan targets a renewable share of electricity of 80% by 2030 through the installation of additional renewable generation (solar, onshore wind and offshore wind). The carbon intensity of electricity consumed in Ireland has decreased significantly in the last 20 years: from 743 gCO₂/kWh in 2002, to 532 gCO₂/kWh in 2012 and 332 gCO₂/kWh in 2022. Despite this improvement, there is still significant work to be done on decarbonising electricity over the next few years, which will need to be done simultaneously with the roll out of new end-use technologies, such as heat pumps and EVs, and improving energy efficiency.

Issy Petrie

Q: I am selling a vacant house. It has €800 credit on the meter. Is there any way I can donate this energy credit to SVP?

A: We don't think there is a way of doing this directly, but definitely check in with your supplier about getting the credit back, and donations are always welcome – you can read more about donating on the website here: <https://www.svp.ie/donate/>

Q: Great presentation Issy - would love to see equity and collective approach - how much would it be to retrofit and provide heat pumps with zero interest loans to those in energy poverty...we know it has to be done, should we just treat it as an infrastructural challenge, with a covid like response?

A: At the moment we see huge value in the Better Energy Warmer Homes Scheme which provides free upgrades to homeowners on a range of social welfare payments. We would still be concerned about private renters in energy poverty, and would like to see equivalent grants for them, subject to them having a long term lease with their landlord. There is also a group of people just above eligibility for these schemes who won't be able to access the credit or finances for retrofit and solutions are needed for them too –this research by UCC and MABS looks into this further: <https://www.ucc.ie/en/media/research/iss21/ENERGISEpolicybriefingpdf.pdf>

Q: Defining energy and fuel poverty enabled if you prioritise public and social housing first in retrofitting- and supports - the Dept saying the definition is an issue is weak and disappointing- anchor with all those in public/social housing and social welfare including HAP payments.

A: We are really concerned about private tenants in energy poverty as there isn't yet a clear strategy in place for this group, and we are concerned about an ever-increasing gap in housing standards if we don't see equivalent grants for these tenants. We also need to see a commitment to have all social housing to reach a minimum BER standard by 2030 – this is a recommendation supported by many environmental and NGO groups in a statement earlier this year: <https://www.friendsoftheearth.ie/press/cross-section-of-ngos-urge-government-to-tackle-cold-homes-a/>

Q: Are "universal" (as opposed to "targeted") benefits necessarily bad? Compare to the arguments for "universal basic income": there are big advantages to universal services/benefits (minimal costs of bureaucracy, no social stigma, universal benefits are intrinsically redistributive etc.).

A: A combination of universal and targeted supports is the best approach because of the points mentioned in the question, as well as the importance of reaching those who might be just above eligibility thresholds for targeted supports. For energy, we think more resources need to be put towards targeted payments this year – including increasing the Fuel Allowance, and extending it to households on Working Family Payment – as we know these households on the lowest incomes faced impossible situations last year and are going into this winter still facing incredibly high prices with no certainty about the support that is coming. At SVP we see an adequate social protection system supported by universal services as the best way of protecting people from poverty.

Mark Mellett

Q: District heating is a proven way to facilitate getting renewables into heating homes, at scale, and can target social housing and those in energy poverty - how do we move on the infrastructural challenge? It is like a new national grid but needed. It has benefits for the grid too. Welcome Mark's system wide approach.

A: This is a great question and the type of innovative transformational future we should look at. I was recently in Iceland where their energy system is effectively net zero as they can use the rich geothermal resources available. There is no doubt that into the future Ireland could have surplus offshore renewable electricity which could be utilised for example to power large

electrode boilers that in turn feed into an integrated district heating network. I think it is fortuitous that the Government has recently launched the District Heating Steering Group Report 2023 [487f6e25-427d-4ba3-acc8-d3b5e6272b46.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/111111/487f6e25-427d-4ba3-acc8-d3b5e6272b46.pdf) (www.gov.ie) which means we are moving in the right direction. As part of an integrated plan we should, ideally be preparing for such district heating systems being available into the future and construction should be designed for such systems. As a matter of interest see what they are doing in the Orkneys. With extract and link below.

'To combat this the local council has registered its interest in a possible District Heating Scheme to utilise a proportion of the surplus electricity that is currently going to waste. In principle a district heating scheme would use the electricity generated by the wind turbines on the main island to power a large electrode boiler. To allow for the inherent variability of wind energy the boiler would feed a large thermal store so that hot water can be stored whenever the surplus electricity is available. Each building integrated into the district heating network would require a plate heat exchanger locally to transfer heat from the distribution network to the individual buildings.'

- https://www.esru.strath.ac.uk/EandE/Web_sites/11-12/District_heating_from_wind/projectoverview.html

Q: How do we shift the focus on 'electrifying everything' to decarbonising electricity, our electricity is not renewable and depends on these same imports. Every sector is looking to electrify.

A: Great question also. Our electricity is not yet renewable so we must accelerate Phase 1, 2, 3 and the future framework which will see in excess of 37 GW of Offshore Renewable Energy (ORE) available in the first instance to decarbonise the grid. ORE can also drive the delivery of Green Hydrogen, Carbon Capture (to add to green hydrogen producing e-fuels) and also carbon capture for sequestration (we need to take as much carbon out of the air as is possible). The airline, maritime and some specialist heavy machinery will not be electrified and must rely on e-fuels created from renewable electricity.

Session 2 Research Sprint

Noreen Brennan

Link to Industry Survey [here](#)

Q: Thanks Noreen! Would love some consideration of geothermal as a constant baseload (non-intermittent) and thermal energy storage for e.g., district heating

A: Thanks for your comment. The use of non-intermittent geothermal energy to compliment a high renewable energy mix and act as a constant base-load is certainly a topic worth exploring in future research, both in terms of policy maker engagement and public acceptance. Thermal energy storage is noted in our end of project report as a potential storage technology, and was highlighted by a number of our industry stakeholders as a key long-duration technology that they are interested in engaging with, along with hydrogen. Our industry project report can be viewed here: <https://vb.nweurope.eu/media/20763/nb-steps-project-report.pdf>

Q: Can you please indicate again what is the difference between Class 1 and Class 2 industry responses? (2nd/3rd slide). Thank you.

A: Thanks for your question. The preliminary results of the analysis of industry preferences for policy measures to increase engagement in storage indicated the presence of heterogeneity when all respondents were grouped together. To get a better idea of whether we could address this heterogeneity, we used a Latent Class approach to the analysis, this splits the sample into smaller groups and indicates the likelihood that a certain percentage of our sample belongs to either group. Approximately 63% of respondents are likely to agree with the preferences of Class 1 and approximately 37% are likely to agree with the preferences of Class 2. This means that 63% of respondents prefer storage policies which help the renewable energy sector to reduce dispatch down, removes barriers to storage from the grid, and do not prefer policies which prioritise long duration storage over short. For Class 2 respondents, the only significant preferences were for any policies which prioritised medium and long duration storage over short. While these are preliminary results and our sample is currently too small to make any statistically significant assumptions on why the preferences for these two groups differ, it is likely to be due to the differences in the types of respondents surveyed. It is possible that Class 2 contains more medium and long duration energy storage developers and so these respondents are less likely to have strong preferences to reduce dispatch down or adjust RESS policies. The preliminary results indicate that Class 1 respondents may be more likely to agree that trade in the ex-ante market is risky, that there are too many barriers to trade in energy and that there are not enough viable business cases for storage. It is possible that addressing some of these concerns may reduce the disutility associated with long duration storage investment. To view more on the engagement results with the sector, you can read our report here: <https://vb.nweurope.eu/media/20763/nb-steps-project-report.pdf>

Vahid Aryanpur

Q: Do you envisage hydrogen playing a role in road freight decarbonisation or is electrification of the hgv fleet preferable?

A: In the net-zero scenario, hydrogen plays a key role in road freight decarbonisation after 2040, particularly for heavy and medium trucks. This shift is driven by factors like limited cargo capacity and longer recharging times for battery electric vehicles (BEVs). The results across different scenarios will be published soon, please contact me if you need further information via: vahid.aryanpur@ucc.ie

Q: Does the panel envisage Vehicle-to-Grid (V2G) technology being widely employed in the Irish grid?

A: We haven't analysed the widespread adoption of Vehicle-to-Grid (V2G) technology in the Irish grid yet. It is part of our plan to address this in future studies.

Conall Mahon

Q: Conall mentioned his results is based on installation post-2030, will forecasting this far ahead cause inherent risk?

A: When forecasting technology and cost pathways in the long term there will always be a high degree of risk. In the project we sought to mitigate this risk by completing numerous sensitivities analysis based on Cost (Fuel, feedstock and Carbon), Deployment date and Technology development (Efficiency, availability, Capex, Opex and Lifespan) to try to future proof results. When making a final decision of how to decarbonise a hard to abate site, specific, up-to-date analysis should be carried out and decisions should be based on the best available information at the time. It will be responsibility of us in the energy space to keep informed on trends on renewable options and update analysis where required.

Q: Thank you, Conall! I would like to ask whether H2 (hydrogen fuels) can achieve energy security for Ireland? As far as I know, it is one of the best sustainable options; however, an expensive option that may affect affordability. Would you like to suggest how we can achieve this? Thank you.

A: The study scope didn't include end use for the fuels or demand however it is a key next step for the study. I would recommend looking at renewable fuels as a whole in terms of what are needed, where and how they should be supported to achieve our energy security and decarbonisation needs rather than fuel specific lens. I believe this could be achieved via a renewable fuel strategy.

Fiona Devoy McAuliffe

Q: In terms of the skills gap for Floating Wind, which European countries would you suggest Ireland look towards for industry development ideas? Do you see floating offshore wind being a significant opportunity to increase gender equality in the wind industry?

A: The UK and Germany are leading in terms of offshore wind development at the moment, so probably they are the best to look at for ideas in how best to develop the relevant skills. I think the growing renewable energy sector as a whole are a significant opportunity to increase gender equality since it is essentially developing a "new" workforce, making it easier to break down existing barriers and foster gender equality from the ground up.

Session 3

Future Perspectives on Energy Security

Barry McMullin

Q: Eirgrid modelling indicates massive overgeneration of wind and solar towards 2030. What changes are needed to use this wasted power to displace fossil fuels in the Irish heat sector?

A: It is firstly important to note that a certain level of "overgeneration" (and consequent curtailment) may actually be cost-effective: 100% "efficiency" (zero energy "waste") is rarely the optimal thing to aim for. That said, of course, it is still important to look critically at any such curtailment and see if there may be opportunities to get more value, particularly in contributing to further, earlier, decarbonisation anywhere in the energy system. In my own view, the first priority there is to squeeze out remaining fossil fuel use within the electricity system: which means routing to service flexible demand (e.g. EV charging and heat pumps) and grid-connected energy storage (starting to address the much hyped times when "the wind doesn't blow and the sun doesn't shine"). In the short term (5 years), storage is likely to be dominated by battery deployment, which can plausibly offer time shifting up to 12 hours, but probably not much more. Beyond that, we need to look at "electrofuels". There are uncertainties and challenges there, but all electrofuel pathways start with electrolysis to produce H₂. So I would say that strategic deployment of electrolysis capacity, that can absorb any emerging curtailment risk, is already a "no regrets" strategy at a national policy level. Electrofuels may also offer an essential tool to decarbonising high temperature (industrial) heat, and even aviation. But decarbonisation of low temperature heat - residential and commercial/public sector - should continue to focus on electrification via heat pumps. (Increased interconnection will also help in avoiding curtailment here, and contribute to decarbonisation in partner countries, as well as enhancing our domestic energy security; but I would still say that our first responsibility, and therefore our first policy priority, should remain decarbonisation of our own energy system.)

Q: Are the governing architectures established globally incompatible with achieving sustainability as experienced over the last 30 years of the COP process? If this is the case, does this impact the trilemma when such governing structures give more weight to security and ignore equity to favour the lobbying of economic heavy weights?

A: It is empirically clear that the existing governance structures at international levels (particularly via the UNFCCC) have failed to deliver an effective (timely, commensurate) response to the climate crisis over the past thirty years. There is certainly an urgent need to explore any and all avenues to strengthen those existing structures and/or develop complementary alternatives. While Ireland is small in global terms, it has a fair record of engagement in international diplomacy. Thus, there is a strong case that Ireland should make a focussed diplomatic effort to catalyse much more effective (and equitable!) global action. And yes, that does inevitably mean confronting and challenging actors (nations and corporations) with economic interests heavily vested in delaying and minimising action. Some example initiatives that Ireland could promote in this direction would include the Fossil Fuel Non-proliferation Treaty, and the global Cap and Share proposal. However, in the meantime, we do have the Paris Agreement, and the various mechanisms and measures under it. It is an unsatisfactory agreement in many ways, but it is the one agreement that we have, and we therefore need to make it work as effectively as possible (even as we also seek to strengthen and complement it). The Paris Agreement is, by design, a "bottom up" framework that relies on good faith implementation by the participating parties (essentially national governments). Thus, to have any meaningful influence on promoting wider international action, it remains essential that Ireland "walk the walk" by implementing its own commensurate, equitable, obligations under the Paris Agreement. The Climate Action (Amendment) Act of 2021 put the aspiration to do this on a solid footing in domestic law, which was an important preliminary step. However, it is starkly clear that we are already failing to follow through on the scale of

action that that aspiration demands. Thus, even locally in Ireland, we remain mired in implicatory denial, far from having the tough societal conversations to understand what a "commensurate" climate response would now look like. Such conversations would indeed require engaging with the "the lobbying of economic heavy weights" and a fundamental re-evaluation of the appropriate level of economic activity to best meet both our own needs and those of future generations.

Claire Dupont

Q: Are the governing architectures established globally incompatible with achieving sustainability as experienced over the last 30 years of the COP process? If this is the case, does this impact the trilemma when such governing structures give more weight to security and ignore equity to favour the lobbying of economic heavy weights?

A: This is a question of two parts. Let me first tackle the first question: Are the governing architectures established globally incompatible with achieving sustainability as experienced over the last 30 years of the COP process? The governing structures established at the global level face specific challenges that do not really have anything to do with the climate problem, but rather have far more to do with the historical setting of global politics, the way international organisations are designed, the distribution of power, and broader developments in international relations.

A lot of research has focused on why international organisations succeed or fail, (see for example this study of the WTO focusing on the mission, resources, and legitimacy of the organisation; or this book 'International organisations and global problems' that looks across issue areas and the global governance structures that try to deal with them). The global climate bodies are part of this international system and therefore suffer the same challenges as any other international organisation.

[Note: by global climate governance system, I refer to the rounds of negotiations under the UN Framework Convention on Climate Change, UNFCCC, of which the most visible is the annual Conference of the Parties or COPs, but there are more rounds of negotiations happening in between these annual COPs.]

Within that broader international political context, we therefore may need to adjust our expectations of what is possible in global climate governance. Whether this means they are fit for purpose or not is a question that can be raised with regard to any global issue.

Most climate researchers would agree, however, on two main points:

- that the global climate governance system has hardly delivered compared to the scale and urgency of the climate problem;
- that the global climate governance system is still essential because most researchers understand that without it, we would be in an even worse situation with regard to climate response.

On point 1: the outcomes of global climate negotiations regularly fall short of the requirements as outlined by science, and instead incremental or symbolic decisions are taken. This is not really under dispute – so arguably, not these institutions are not fit for purpose. Furthermore, what matters more than the decisions is the implementation, and here global climate governance institutions have little power to force countries to take action (political choices in the design phase of the global climate institutions are still playing out).

The Paris Agreement was among the most interesting outcomes of global climate governance, with the goal to keep global warming well below 2 degrees Celsius, compared to pre-industrial levels, and as close to 1.5 as possible. The Paris Agreement also instituted a commitment and review process that relies on peer pressure and good will. This isn't entirely ineffective, and it is a system that allows other actors to put pressure on governments (NGOs, citizens, business actors) if they are not pulling their weight. Some links that might be interesting: an article on non-state actors in global climate governance; another article on negotiations towards the Paris Agreement; two articles on the EU's leadership role in global climate governance, one published in 2008, one published in 2021; a perspective article on climate ambition published in 2019.

On point 2: The negotiations allow us to bring together an incredibly diverse representation of humanity – nearly all countries are part of these negotiations, and they actively participate. Without these negotiations, it would be difficult to imagine that the EU would voluntarily have started developing climate policies in the 1990s and 2000s. It would be difficult to imagine that the concerns of small island states or Global South/developing countries around climate justice would have been placed so centrally on the agenda. At the same time, most governance research focuses on the weaknesses, such as the unequal power of different actors (including lobbyists etc., who are often functioning most effectively, and sometimes more invisibly, at national level driving the positions of different countries), lack of transparency, legitimacy and democracy questions.

In sum, no the current institutions are not really fit for purpose given the scale and urgency of the problem, but yes we still need them because the nature of the climate issue is that global action is required, and without them it is highly likely that we would be in an even worse situation. They are not perfect. But there is no other global context that brings so many actors together and we shouldn't underestimate the importance of scheduling regular rounds of negotiations, allowing for a build-up of pressure on actors, or for the symbolism of global politics in this context.

Muireann Lynch

Q: Eirgrid modelling indicates massive overgeneration of wind and solar towards 2030. What changes are needed to use this wasted power to displace fossil fuels in the Irish heat sector?

A: Meeting 80% RES-E targets by 2030 means there will be significant curtailment of renewables. The optimal amount of curtailment is not zero – given such high RES-E targets, there will inevitably be some curtailed power during periods of very high supply. This fact notwithstanding, there are several options available to minimise the curtailed energy including, but not limited to, battery storage, compressed air energy storage, hydrogen and/or synthetic biofuel generation, flexible demand, and heat storage. The most efficient of these options depends on several unknown factors, including the future costs and demand for hydrogen and biofuels, the flexibility potential of existing and future demands, the future cost of storage technologies, interconnection levels, and electricity market design.

Q: Can we create new markets for 'interruptible' power supply for heat, to ensure that revenue is obtained for all local wind energy generated, to make CfD support for rapid wind expansion financially sustainable? E.g., Displacing some use of imported fossil combustion fuels?

A: High RES-E means a greater divergence in supply and demand over time. This means that there will be greater incentive, all else equal, for novel electricity demand contracts, which includes the possibility of interruptible supply contracts. Research by ESRI and others suggests that there is potential for uptake of interruptible contracts by Irish households, even for existing appliances. Market design and regulation should be flexible to accommodate these possibilities going forward.

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