

**File name:** Invest NI - Energy Transformation Event - Chapter 1 - Welcome.avi

**Moderator questions in Bold**, Respondents in Regular text.

**KEY: Unable to decipher** = (inaudible + timecode), **Phonetic spelling** (ph) + timecode), **Missed word** = (mw + timecode), **Talking over each other** = (talking over each other + timecode).

M: Can you all hear me here? Okay. Yes, we all good? I'm not one for standing beside a microphone so I'll just try and wander about, if you don't mind, for a few moments. So first and foremost, I'd like to thank you all for coming along today, it's a bit of a tight squeeze but just to give you a bit of background, initially whenever we envisaged this kind of event we thought, maybe twenty, 25 companies would host it in Invest NI and we'll get them together and it just shows the level of interest in this decarbonisation and the energy transformation agenda at the moment. So really, thank you all for coming along. And, as I say, a big thanks to the speakers in advance just for obviously lending their weight and hopefully you'll get something out of it today.

So I suppose just firstly, my name's Eugene Heaney, I'm the Green Economy Business Development Manager for Invest Northern Ireland. So the team that I lead up has been, kind of, looking at this area as part of it and I'll touch on it just later on. Part of our overall, sort of, Green Economy agenda, as I say-, we'd like to try and move this conversation forward as much as we possibly can. So really a big part of today is about opening that communication. So let's talk, let's get-, you know, discuss the challenges, discuss the barriers and try and bring that together collectively if we possibly can. So just running through the morning, I'll not go through this individually but really in the early part of the morning Matthew is going to give us a quick overview on the Industrial Energy Transformation Fund. Where it is, how it's positioned, what it's been used for, to give us a bit of a background to it. Some of you may be familiar with it, you may have gone through this process before. Some of you, maybe it's new to it so we'll try and give you an insight into what needs to be done there. And then moving on from that we'll be looking at a couple of particular areas that are the focus of it, which are the feasibility side, engineering studies and the deep deployment side. So Nersi (ph 01.54) and Tom are going to give us an overview of that.

Moving on to the second part of the morning, very quickly we're going to look at-, our other activity is happening in the energy efficiency side which, again, fits with the industrial decarbonisation stuff. And also some work that might link into it which Case (ph 02.11) have been leading on. And you'll see here, we've kind of mapped out all the companies that are represented here today across and you can see-, it's maybe a bit hard at the back but you're welcome to come up and look. There's a real great regional spread here. But there's also clusters of companies that we could possibly start to do stuff with, both from an industrial energy transformation context and other activity that's happening here in Northern Ireland. And leading on from that, then Richard and Jim will give you an outline of what investing I (ph 02.37) can do in this space at the moment because we're obviously aware that this may or may not be applicable to companies so there's other support that we offer in the moment that might help you start to transition

towards that net-zero agenda. And also at the end of it, 'What help can we give you?' If you want to go down this path it is intensive, the guys will outline that, but can we help you position yourselves in a better way to try and secure some of this funding? So hopefully that's the way it'll work and then a bit of lunch at the end.

So the ambitions for today, really, as I said, just to give you an overview of where the IETF sits at the moment and whether it's worth considering. Looking at the type of knowledge, the technologies, the solutions, the things that you might need to do if you're considering to go down this road. And then obviously connect with other individuals. There are people here that have been through this process before, other companies. So think just to understand each other's challenges and where we are with that is something that you can't really put, you know, a figure on. It's really up to the individuals to get to know each other and understand that. Obviously, you know, looking at investing I-, what support mechanisms we have and, as I say, essentially, if this isn't for you, there are other options that you can look towards, there are other avenues that we can explore. So we'd like you to take that away with you today, don't think it's all about one thing. Yes, we think there is a chance to develop a few projects, to move at and hopefully use those as exemplars that everybody can gain from, but there might be other avenues that we can explore. And that's really where I want to get that knowledge sharing piece. I think the more we can talk, the more we communicate I think the better it will be for us all.

So I suppose to give you a bit of background to the team that I lead up within investing, I-, it was formed just recently, towards the tail end of last year and essentially it obviously recognised the influence that the Green Economy's having. So we've two broad strands of work that we operate in. One is obviously the new market opportunities and the Green Economy, so to help businesses try and explore those. If you're looking to exploit the Green Market opportunities and trade, or from a foreign direct investment perspective, if there's any capabilities or any gaps in Northern Ireland's offering, that's really where we sit. We're trying to corral that together and create that focus. But obviously with regards to today's conversation, a big part of that is helping Northern Ireland businesses go greener and improve their efficiencies in decarbonisation. And a big part of that, we're hoping, is if we can help the companies transition towards that, the technologies, the solutions, the companies that are delivering that will then be able to use that technology and export it as well. So there's a win win for everybody. It helps you to, you know, down that decarbonisation journey but it also helps our companies trial, test, perfect that technology and then export it across the globe.

Where does it come from? Well obviously some of you may or may not be aware, like, there's been a movement, really, in the climate side of things. You know, we can debate about how achievable some of these things are, but basically these are ambitions that have been set now, at the moment, through the various documents. Path to Net Zero, Climate Change Act. Obviously 80% renewables by 2030, doubling the size of the low-carbon economy. We're not going to, you know-, emissions down by 48% by 2030 and also 25% buildings and energy savings across industry and housing. So those are the challenges that we've set ourselves, they're the targets that we've set ourselves from a governmental perspective. Our

team is hopefully trying to help move that along and you can see yourselves there is a challenge there. Agriculture, which you know, David Case will look at. There's a linkage there, we can help agriculture, maybe help industry as well. So there are sectors here I think that will link in together in that net-zero journey and hopefully you'll start to understand that a little bit more today.

But I suppose if you think of it in the context of Northern Ireland, 'How are we doing to date? And why is this such a challenge?' I think this tells us all. In 2020 we accounted for 5.2% of all UK emissions, with a population of 3%. UK overall, as of 2020 from 1990 baseline, sitting just about 50%. England you see 52, 51. Northern Ireland 23.9. So we're half of the UK average at the moment. It was a staggering perspective to be looking at at the moment. And by Derry's (ph 06.51) own figures, we set those targets of 23, for 2030, we're basically 20% off where we need to be in terms of our carbon reductions at this sort of estimation. There's where we should be, there's where we're probably projected to be. So we need to do something, we need to change the dial, we need to improve how we're doing things. And obviously I needn't-, I don't have to talk to you, you know that there's challenges there in terms of the commercial and the profitability aspects whenever you look at your contracts nowadays.

So what does the energy transformation fund do? It delivers, really, two main objectives. Try to reduce energy costs and emissions for industry, and bring down those risks of the decarbonisation side. So that's essentially what it's there to do. It's targeted industrial processes and it's opened a lot of businesses. So that's essentially what it's looking to do. But if we look at those energy costs, again I don't have to explain to most of the people round the room, depending where you sit here, you'll understand that's from, that's from the utility regulators own figures. If you take a large company which there is a good number in the room, on average at (mw 07.59) medium we're 60% higher than the EU median (ph 08.04). So again we've serious commercial and profitability challenges that we have to address moving forward. So that's something we'd like to try and help and improve and move forward. So as I say, those are where the challenges are. Going back quickly to the IETF, if you look at it there's been two calls. The third call now is coming in 2024 and I can't stress enough, that's something we need to look at and we need to get ready for now because it is quite intensive, it is quite onerous in some aspects. But it is also quite lucrative in terms of moving the dial on this decarbonisation agenda.

So far there's about £ 170 million worth of funding, 175 projects through the first two calls, but only eleven of those has come to Northern Ireland so hence we want to try and encourage you to think about it, consider it and look at how you develop those projects moving forward. Those-, largely food and drink sector is where it's at, at the moment, you know-, although quarrying and waste recycling so there is a bit of success there, we have been successful, other companies have tried it and it hasn't worked for them but, again, we hope maybe by starting this conversation a little bit sooner we can help them, maybe, fill those gaps that they were missing in previously. But you see yourself, the rest of GB here, Scotland's got its own projects. The rest of GB is obviously securing a lot more than we are at the moment.

So we've quite a lot to cover today. You're going to get the chance, hopefully, during the breaks and out to chat to the speakers and find out a little bit more about what they do and maybe talk to them about something that might resonate with your business. But what I would say is if you do-, if you don't get speaking to the right person or you don't get speaking to ourselves in whatever context, please email the [greenecommydevelopment@investni](mailto:greenecommydevelopment@investni) and we'll answer any of your questions, we're happy to follow up with anybody in terms of your project or what you're considering or how you're looking to get linked in with people. We have a lot of connections, obviously, across the technology awarded in this space. We'd be more than happy to connect you across those various individuals, both in the room today and beyond that as much as we can. And, as I say, if you're doing any social media, if you don't mind IETF24 and INI Green Economy, just if we could try and build this momentum and knowledge and understanding and communication moving forward.

So now moving on, the first speaker is going to Matthew Rhodes (ph 10.12), Matthew now has kindly joined us from the Black Country, I suppose, so as I say, Matthew will give us his perspective in terms of the IETF, some background, some understanding and, as I say, happy to pick up any questions that we have in the round. Right goes Matthew, okay.

Captions by Verbit Go

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Matthew Rhodes: Good, good morning everybody then and thank you very much for inviting me this morning, Eugene and Invest Northern Ireland. I guess my qualification for being here today-, oh, I'll just-, I'll move on, is I've spent most of the last seven years lobbying the British government on behalf of medium- and smaller-sized manufacturing industry in particular to try and get the message across that funds like this need to be more accessible, they need to be more open to firms right across the economy and easier to get at. So, I guess it's, it's, it, it reflects that, that lobbying that I'm here today. We're making slow but, but, but very, very slow progress but at least we're making some progress on, on, on this front. So, what I'm gonna cover this morning, and I'm not going to repeat anything that Eugene's said, and, and I'll try not to go into too much detail because that will be covered by future speakers as well. But I'm gonna put IETF in the wider context of funding available for this kind of project for industry here in Northern Ireland. So, how it-, how it fits into industry energy policy altogether. And then I'll talk through phase three, with what, what's in there, what's likely to be in there and some caveats and tips from people who've tried to, to bid for this altogether previously. So, in terms of where this fits in, in industrial energy policy across everything that, that, that's done in the UK, this has really been the biggest fund that's available to industry across Northern Ireland and the rest of the UK. It, it's, it's designed for manufacturing and mining industry, it goes alongside a range of other programmes which are largely designed for petrochemicals and, and infrastructure type projects so they're less accessible, so they, they mostly work for larger firms. So, things like ETS, some of you'll be familiar with emissions trading schemes and the, kind of, change levy and so on. There, there are other funds available from organisations like Innovate UK and they shouldn't be-, you, you, you should look at those as well cause they can often be easier to access. The government's currently putting about £20 billion into transforming the North Sea coast of the UK away from petrochemicals towards things like wind farms and so on, and, and what we're trying to do is get more of that money available for manufacturing industry in, in general. So let's come onto, to IETF itself.

So, this is a, a fund that, that can either give you feasibility study funding for feasibility studies or engineering studies for your projects, and I'll come onto those in a moment, or it can give you capital funding for equipment you're gonna install in your-, in your factories or, or manufacturing plants. A big caveat I have to say upfront is phase three has been announced, it will be announced-, the, sorry, the details will be announced in the spring, the actual rulebook hasn't been published yet so the assumptions behind this presentation and all the other presentations you hear this morning will be that phase three will be very, very similar to phaser two and phase one of the programme, which were £315 million. So what's the government's said is, 'We're gonna put another £185 million on the table, make it available to the economy and, and firms across the economy from-, in, in early 2024.' They consulted on, on the rules for

it about three months ago, so that consultation's closed and everyone put their, their two penny worth in in terms of how you-, how you might make this more accessible and, and modifications you might make to it but we all have fairly low expectations from that, so we're expecting it will come out more or less the, the same as phase two. And everything else I say this morning and I suspect everything everyone else says will be about phase two, on the assumption that phase three will be the same. But the-, minor adjustments are possible, that was my first point. It's a notional £185 million to add to the £315 million that's already been put on the table. Of that, that was divided into two, two chunks, £289 million for Northern Ireland, England and Wales, which Eugene referred to, and £26 million for Scotland, so they had their own scheme which was slightly different. And as far as I can see, and Eugene has a similar figure, only about £170 million was actually spent, so there was a bit of political double, whatever you-, double speak going on here when they announce a further £185 million, cause it could well be the same amount of money.

What-, the way the initial £300, inverted comma, million was allocated in tranches of about £60 million a go, so, so the government will publish, presumably in the spring, a, a, a first bit of phase three and they'll say there's X million available, maybe about £60 million, that will be subdivided into the different deployment funds and the, the, the feasibility funding and the engineering funding as well, so they, they do break it all down in, in some detail. And the theme that you'll see continually throughout this presentation, and probably the presentations to come, is this is made significantly more complicated, really, than it need to be, in my view, and you do need to pay attention to the details cause you can waste time. I, I worked for quite a long time with a Welsh company applying to this fund and at the end, they, they'd spent months of effort on it and they decided they couldn't-, they wouldn't be eligible and didn't actually submit the funds so you do need to read the rules before you start. In terms of grants, the largest grant that's been given so far is £7 million for a capital project, to Stanlow Oil Refinery, on Merseyside, and the smallest grant is £19,000 to Kellogg's for a, a feasibility study. The scheme targets energy dependent, energy intense industry and there are SIP codes (ph 06.17) which you have to forward in to be eligible to apply from the outset, so those are they on the screen there, which are self-explanatory and, and, and common sense really but it covers all manufacturing firms. As I'll show at the end, everyone has applied so the, the, the money has been allocated right across the economy. There are, basically, three or four different categories of fund that you can apply for, so there's a study strand of this which is from £30,000 or £50,000 a pop upwards and it-, so that, that, that's for a feasibility study or an engineering study, I'll come onto those on a-, on a later slide, what-, the difference between those but study is self-explanatory. And then there are deployment funds for actual capital plant that you're going to install in your factory.

Key point for, for this scheme is it doesn't cover a feasibility study that looks like, 'I've got a factory, I want to become greener, I don't know what to do, I'm going to get some people in to look at my factory and tell me what the answer is.' That is not an eligible project, you have to know roughly what the answer is before you start, so you need to know, 'I want to install such and such a technology and I'd like to look at the feasibility of that in my-, in my operation,' that, that's the basic philosophy behind this scheme. Right. The funding thresholds are quite high for smaller firms, so we have been lobbying to bring these down with, with limited success. I-, I'm-, I guess all these slides'll be available afterwards so I wasn't

gonna go through them in, in the-, in the detail. Do note the difference between eligible costs and grant funding. So, eligible costs, the smallest grant that's been given under this scheme is £19,000 to Kellogg's for a feasibility study but the feasibility study as a whole will have cost more than £30,000, so, so they're, they're taking a 50% share of a, a £38,000 study probably. The difference between a feasibility study and engineering study is the end point. Of a feasibility study you should get to a point where you know what you need to do, so, so you've, you've got a-, you make a decision that that's a worthwhile thing to, to take forward. An engineering study is, is a feed type study, so you get to an investment case at the end so you're-, but you're able to say go, no go on, on the actual capital project so that's, that's the distinction they make. This scheme is full of those, those kind of niceties which are, are a little bit academic but very much a Whitehall, kind of, civil service way of thinking, and you have to begin to get into that mindset. Right, oh, the, the other point was timescale, so all the previous rounds you get about two and a half months to put your bid together. So, they might announce in September, they, they'll publish the call is open and you have to get your bids in by December. You'll then have to spend the money from about six months after that, so the last one announced in September, closing date by 9th December, from memory, and you have to-, you can't spend any money before the following May.

And you then have to do it all within one year or two years, so again you have to be pretty clear what, what you're doing and you, you have to have a team in place, another theme I, I'll come back to. The feasibility studies have-, the money has to be spent within a year of, of that, that May date, so you-, the money has to start being spent after the following May or six months from the, the call date, it has to finish being spent within a year of that. For the other two, for the engineering studies and the capital grants for your plant being installed you have two years to spend the money but, but there is a limit on, on when you spend the money by. There are two types of deployment projects, so there's energy efficiency which is about reducing your energy bills, your energy costs, your, your energy usage in, in, in the-, in the facility. And a deep decarbonisation, which is actually about emissions reduction, so you might have the same or you might even have higher energy bills but, but you've switched from, say, gas to hydrogen or to electricity, a green electricity, so there, there's that distinction made as well. And, and these are-, in the middle of that, those-, these two charts, you, you'll see that there's an actual award level which is 50%, 60%, no, 30%, 40% or 50% here or 50%-60%, I think, on, on the feasibility studies, which means you'll, you'll get 50% of the-, of the total value of the project actually given to you. Aggregation and collaboration are encouraged, this was an early lobbying success because-, so, this, these-, important thing to say about these, this scheme is it has to be led by the actual manufacturing operation, it cannot be led by a consultancy or a university or an organisation that specialises in getting grants, has to be led by you, and that's probably a good thing. You can work with partners but, but it has to be led by the manufacturing site. What makes it challenging for smaller businesses, you're not allowed to aggregate, say, five, ten, fifteen similar businesses together, you-, which, which you might want to do if you're an industrial estate or something like that, so it rules that out and I'm-, we're trying to get that changed.

What, what they did do was say that if you're a, a single company like Kellogg's you could aggregate five sites across the UK and so one bid, so you have one team bidding, which actually saves quite a lot of time. They also encourage collaboration, and if you look at successful bids you'll see an awful lot of them are collaborative, so they're led by an industrial company but they've got a team who are working on a

project which might include an engineering company, a consultancy, or whatever, or the, the installer of the-, the manufacturer of the-, of the kit. Those are both good things to have. I, I'm not going to spend much time on the details of the schemes because we've got other speakers who are going to go into this. Energy efficiency, it's, it's kind of common sense, the kind of thing that will include. These, these projects have to relate to a-, your manufacturing operation, so if it, if it's just improving your building that, that's not good enough, it has to be associated with that which you're, basically, making and selling, your, your, your key industrial activity. You, you, you do need to be slightly aware-, well, as I say, read the rules, it's, it's, it's just a common sense statement and everyone says it but, but these schemes are ultimately-, or the applications are judged by civil servants and they will read-, they will read the applications and they, they kind of seem to be looking for non-eligible applications, so do read the rules and make sure you, you fit within them, and that's quite a big, big task. Yeah, and, and, and, and an important parameter here which caught out my, my Welsh friends was where the-, what they do is they look at the relative costs of your energy efficient furnace, so your energy efficient bit of kit versus just buying another one of the one you've got already. And, and the fundable bit of the, the investment is actually the difference in cost between the two. So if, if a, say, an electric furnace or an electric bit of kit cost, you know, £120,000 and the just replacing your gas bit of kit cost £100,000, the eligible funding would be £20,000, which is the difference between the two. So that's the energy efficient bit or the deep decarbonisation part of the project.

And that bit can fall below the threshold, so you think you're doing a, a bid for £150,000's worth of capital kit and you find out you're only bidding for £50,000, you're only able to bid for £50,000, and that can be very-, that, that can cause problems so look very carefully at the value of the scheme and, and how you're gonna organise it. The assessment process is bureaucratic but rigorous, I-, they usually employ independent experts who they get to score these proposals but against given criteria, you can read what those criteria are, it's worth writing the words carefully against them. There's, there's quite a lot of words to get your head around, it's like a two day job to read these rules, just, just warning you. There, there are better schemes and we're trying hard to get them to simplify-, it really reflects the fact that civil servants don't understand industry, in my opinion, rather than anything else but there we go. The, the rules are all there, if you do read them you should be able to put a good, good bid in. The thing I would advise everyone to read is on, on the government website they have published case studies, they've published-, virtually all of the successful bids are listed and there's little pen portraits, effectively, of what went into the bid. So, you can-, you can look at your industry on, on there, you can look at people who've won money in your industry and you can see how they did it, which is quite a good starting point. It's not easy money, as I, I've said, yeah, so you have to provide information, example, on this slide, how you-, if you-, if you were going for hydrogen, you're gonna put a bit of a hydrogen plant (ph 15.56) and you have to explain how you're gonna use, actually use the plant in-, within five years etc. And they do come back and heck, they, they like to monitor all these projects so there's quite a-, high overheads in, in, in this scheme. And note the exclusions, I've, I've, I've, I've done that to death really, it's not-, it's not about ongoing operational costs, it's not about building improvements etc., etc., etc. Yeah, I, I thought I'd just put this in context as well because this isn't just about going green, that is really important and we do have targets and there are policy support for that, and that's why some of this money's being made to-, made available, but we also live in a world where other countries, other trade blocks are investing in this.



And the US, for example, have a £5.8 billion industrial energy transformation fund equivalent, very similar scheme they announced £600, well, £369 billion last year for a climate change inflation reduction act, in the first line or the first page of that this, it says, 'This is about climate change and manufacturing competitiveness,' they, they put the two in the same breath and, and that's very much the way to think about this, it's about getting your energy costs down to competitive levels worldwide. And the EU responded to that with a green industrial plan which reduced the constraints on state aid, so individual countries can basically break the state aid limit and, and put some protective measures in place. And they're also talking about carbon border adjustment mechanisms which, which we're likely to copy in the UK. So there's a lot going on and it's quite important to get your head round this sort of stuff. We are beginning to catch up, we've got this phase three of IETF which I've been talking about and everyone else will be talking about today, we're also beginning to look at how we replace ERDF programmes which supported smaller businesses in energy efficiency for the last as long as I can remember, ten years or so, with shared prosperity fund. There's a national pilot been announced of a business energy advice service which we're actually leading in, in the West Midlands. There's local industrial decarbonisation plans which Innovate UK are running and that's money to help places like Northern Ireland put plans together for decarbonising their industry, which is really good, it gets all the, the stakeholders together and I think Eugene's gonna talk a bit more about that later. And we're also looking at-, so reform of electricity market arrangements won't apply to Northern Ireland, I know, because it's a separate energy market from England and Wales. But the principle there of actually having a separate electricity market and energy market for industry, separate from consumers, is a principle which is beginning to float and take traction across Europe as well as in, in the UK. And that's a really good idea cause the costs of renewable electricity, at a time when Vladimir Putin is messing around with global energy markets, global gas prices, is about a tenth the cost of gas,

And at the moment those two markets are linked and, and that's really unhelpful, you all saw what that did to fuel prices last year. We, we can do better but the good news is we're beginning to think about it. Yeah, the legacy from Boris Johnson and the last few years of chaos, to be-, to be kind, is that the overall industrial energy strategy has been to put infrastructure in place for carbon capture, for hydrogen and focus very much on petrochemicals and almost forget about the rest of the economy. We're, we're, we're working really hard to, to change that and I, I, I begin to hope that we might be making some progress and it's great to be here talking about it today. IETF has strengths and weaknesses, I, I've touched on. The strength is there's lots of money out there and you can get significant money for projects, so up to £14 million but £7 million's been given so far. There's no requirement for innovation, there's, there's a lot of money, Innovate UK (ph 19.55) as well for, for people but you have to be innovative there, this isn't about innovation, this is about carbon reduction and energy saving, that's quite important. 90% of the grants I've seen in the last twenty years have been innovative only. And it has to be led by industry, again that's a really good thing because universities can Hoover up lots of other money. The weaknesses are it's really bureaucratic, you have to be prepared to invest. I've had an estimate from a engineering consultant who's done half a dozen of these that it takes £100,000 per bid, he is working for larger companies but doing it properly is an investment and you need to enter it with that-, with that mindset. And 'They don't let go' is a reference to friends in DESNZ who want to know every three months how you're getting on and that kind of stuff. If you can crack it you can do very well, people have cracked it right across the economy. Eugene referred to food and drink, that's actually the biggest winner of this funding, so if you-, if you combine the food sector with the drink sector you get something like 23% of all grants have gone

to the food and drink sector. The next, next biggest one is petrochemicals, unsurprisingly.

Some sectors are really cute and they do the same bid three times in successive calls for different plants round the-, round the country so you, you can-, you can play the game and win. And all that information is available on the website. Final slide, you know, what I would do if I were bidding for this, right? I would do it in partnership or I'd have a well-funded in-house team. I'd, I'd position it in, in, in a framework of, 'I've got a, a pathway to net zero, I've got a roadmap, the company, this will help,' because you have to show that it-, that, that, that it's taking you in the right direction, so a good narrative. 'Must link to industrial process' I've talked about. You must have an project, you've got time to do it and you've read the rules. I'll leave it there, thank you very much.

**Moderator: Thank you, (mw 21.56).**

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Nersi Salehi: My name is Nersi Salehi, I'm the managing director of a company called Pro Enviro. Thank you, Eugene, for inviting us to come over and get to know you, and help Northern Ireland in your journey to decarbonise, and catch up, to some extent. We are aware of the fact that, for whatever reason, at the moment, as Eugene covered earlier on, you are not actually hitting all of those marks, and I'm sure, you know, after the meeting today, you would all be energised to apply for IETF. Or I'm also pleased to say, we have worked with Eugene and Richard, the team here at Invest NI, and we have yesterday heard the news that some further funding for industrial cluster, local industrial cluster decarbonisation is being made available by Innovate UK, for further support for the industrial sector in Northern Ireland. So a lot is happening, a lot of good work is happening. I actually intend, in this twenty minutes to cover, put a bit more meat on the bone of what was actually discussed by Eugene and Matthew, but with focus on the two areas of studies, what we call feasibility study, and the second one is then an engineering study. You heard there are actually-, I cover that, there is a need for, and knowing whether the technologies that you are actually applying, is going to be right technologies for your particular requirement, for your particular sector. It is absolutely critical to choose the right partners, and put together a project, that you know it would work. So the discussion, just next twenty minutes, is about how to put that project together, that would give you better chance of success.

A bit of word about Pro Enviro. We have worked very extensively in decarbonisation of the industrial sites within the Midlands area of the UK. We have worked with Worcestershire, Herefordshire, Shropshire, Staffordshire, and we have actually helped with both energy efficiency and decarbonisation programmes, you know, developing strategies to decarbonise. This project is one that we actually worked with quite a number of partners, that's Andy Street, the mayor of West Midlands, for what we call cluster decarbonisation. That's actually a project that I just, earlier on, said money has been made available by I UK, Innovate UK, for Northern Ireland to actually create a cluster decarbonisation project. So we are really looking forward to-, that was announced yesterday. Looking forward to work with industries in Northern Ireland, to pass on to you the experience of how cluster decarbonisation can be made available. And you can also bring these projects closely together, so learn from the experience of one, and actually learn how to put together powerful, say, tenders into business, for the IETF programme.

IETF programme is, as Matthew covered earlier on, is bureaucratic, is run by the civil servants. The aim and objectives are to help you put processes and system together that would actually help to decarbonise at energy efficiency in the short-term, and also decarbonisation in the longer term. They went through the

eligible processes, it is actually process based. This is very important to actually note, that it's about how processes could be decarbonised, and result in reduction in energy consumption and emissions, for both the energy efficiency strand, and also the second strand, which is more about decarbonisation. Energy efficiency, they want to have TRLs, you know, technology ready levels of eight and nine, so they want you to actually look, and think, about processes and systems that already are in place, and they are actually providing savings. With the decarbonisation however, they are actually looking at processes that would be TRL six and seven. They want it to be almost ready for the market, if it is not actually ready for the market. These are very important, otherwise you would put a lot of time and effort into processes that would be rejected in the assessment phase. I cover the, the assessment phase in a minute as well.

The process is lengthy, it would take some time-, you need to know the metrics, you know, how to go about it. You need to prepare yourself now, if you are going to put together a successful bid. There is going to be a four-month submission. It's a competitive process. So what you need to do, is to submit your tender as well as possible, as effectively as possible. Because when it goes to business, at the end of actually the process of selection, they will choose, they would decide what would give the highest return on the investment, that public sector investment that they are putting into your operations. It takes a month for-, from the submission, the deadline. We don't know when the deadline is. Some time early 2024, there would be the, the deadline, but they would give you four month for actually submission. There would be a month of review by the external consultants, who decide whether or not the, the tender, the, the, the application that they have put together is eligible. If it's not, after a month, they notify you. You would have chance of-, they would tell you what the problems with the, with the submission is. So you could actually attempt to submit on the future rounds, because they put this in several rounds. This is actually the round three, which could have several rounds actually within that round three. Then within three months, they would come back to you, if your, if your submission is eligible, and would notify you that you have been successful. Then there would be two months of, actually, due diligence, to make sure that, you know, what you have put together will-, the company is viable, you know, the partnership would work, and there is another process, it's a bureaucratic process, but if you get to that point, the chances of actually being rejected is quite small. Finally, they would give you the go ahead. That process takes about six months, but-, so you prepare yourself. If you have got a project that you want to run quickly, you have got it oven (ph 08.15) ready, then be aware that you can't actually start delivering it before the six-month process of selection is up.

There are-, I am covering the, the feasibility study. The feasibility study is actually-, the scope for it is to-, investigation of technical, economic, and operational impacts of deploying technological solutions within an existing industrial process. That actually is very important. So you need to have existing industrial processes, you need to have selected, have, have identified a solution. So you can't do optioneering, you can't look at several different, sort of, options that you might have, to see what would give you the best return on investment. They want you to know what you are going to do, what technology you are going to actually look at, and then assess the impact of how you can bring that technology to your operation. As Matthew, earlier, mentioned, you can aggregate, you can have up to five sites that can be looked at, for the same technology. So if you have got multiple sites, you can actually aggregate the site, and then make sure that the total sums are within the eligible, eligibility criteria. It's the investigation of costs and

benefits that that technology can bring to your operation, establishing whether the potential technology is technically and commercially viable in your operation, and to enable the lead applicant to reach a conclusion, that would give you the confidence that-, or give the organisation the confidence that they can take it to the next level.

At that point, you can actually apply for the engineering study. Which would require-, so I should actually clarify that you don't need to have the feasibility study, before you do an engineering study. You can go into the engineering study straight away, if you know what you are doing, how you are going to do it, what technology you are going to use, what partners. You know, it's very important to have the right partnership in place, and they want you to define, you know, the, the work packages that each partner would actually, sort of, deliver during the life of the programme. They want, in the engineering study, to have a full, front-end engineering process. So they are looking at flow diagram of how system will actually fit in your operation. They want to actually see that you have actually looked at how best you can deploy the process, without actually creating risks to the operation. As Matthew said, they are very keen to see that the technology, that you are actually going to deploy, has additionality. That additionality is really important. So they want to actually make sure it's value for money, first of all, and then there is an additionality.

So they want you to actually look at, if you are replacing a boiler, with an electric boiler for steam generation, the eligible component is actually that which is the difference between what you had in place before, if you replaced it with a gas-fired, steam-raising plant (ph 12.02), with that of if you replaced it with a hydrogen technology, or any other technology. The eligible component is that that's additionality, or the difference between the two, let's call it, technology deployment within that operation. They want all of the issues of impact assessment, so far as environmental permitted is concerned, environmental impact assessment done, planning consents to be covered, economic analysis. They want to know how much savings, in energy and carbon, the replacement of technology would result. But also, it's very important to know that they want to actually see megawatt hours of reduction, you know, this is because the investment is quite large, they want to see large-scale reduction in energy consumption and cost. However, if the engineering design is for deep decarbonisation, rather than energy efficiency, there is an understanding that potentially there would be increases in energy consumption for a period of time, if the technology is about-, this is why the difference within TL eight and nine for energy efficiency, and TL six and seven, five, six, and seven for decarbonisation. And then they would expect actually a submission, which would be comprehensive, covers all of the risk, risk assessment, and then that submission would-, you are ready to actually apply for the deployment phase. Which is actually going to be covered by one of our colleagues here, later on. So I'll leave that one to later.

So the next important issue is how you can put together an application that would be successful. The, what we call, the assessment criteria part, part one, covers 65% of the overall scoring. So it's very important, the highest is how much carbon you actually would save-, energy and carbon you will save, reduction in emissions, reduction in cost, whether the technology solution that is chosen is absolutely

viable, and would result in significant reduction, you know, in, in cost. The feasibility, technical feasibilities is an important one again, with 20%. They want to actually see evidence of feasibility. So it is important that you can prove that the technology has resulted in significant reduction elsewhere, so in the sense use the examples of previous successes. The next criteria, assessment criteria, covers 35% of the, the weighting, and that is for completing of financial impact. You need to everything online, and description of the, the way-, actually, for this particular type of funding, they really do like to see that the process can be replicated, so-, and they would want to actually monitor. So it is very important that you actually appreciate, that for a long period of time, DESNZ would actually-, for three to five years, you need to actually provide submission of success, of actually reducing your carbon emission, if it is the deep decarbonisation, or energy efficiency, if it's actually reducing your energy consumption and cost, and also sharing it.

So actually, some of the successful submissions were put together with consortiums, that a work package is delivered by the association, so if you have got, actually, university partners or associations, actually part of your consortium that you are putting together. The lead organisation should be always the manufacturing operation, that's really important to know, but it would strengthen the, the, the viability, let's put it, because it takes a lot of time, putting these together, time, and effort, and energy. You need to know what you are doing, but when you put it together, if the work packages are defined, and the delivery is actually defined, how they are going to go about it, in a Gantt chart, then you would actually score quite highly.

Supporting evidence. Finally, I'd like to cover what you can actually submit with your tender. It is important that you submit, especially for the engineering, process flow diagrams, mass energy balance. It's important that you actually do the technical feasibly, is-, what the deployment of that technology would mean, what the risks have been, and how you have assessed the risks, and mitigate those risks, and then actually deployment for your manufacturing processes and output. You can actually add energy assessment facts and figures, and by that, the successful-, some of the successful processes, applications, they had very good AM&T system in place before the submission of the app (ph 18.20). So they know the, their energy mass balance, in details of how that process in it's entirety actually costs in energy, and how much carbon it emits, or one of their strands (ph 18.36) that is actually, sort of, eligible for funding, is actually deploying very detailed AM&T system, automated monitoring and targeting system. So you would know exactly what happens, and improve the management of the processes and systems that you are actually deploying.

Just to wrap up, I thought it would be useful to give examples of some of the successful applications. On the feasibility study, the, the, the one that, actually, Matthew covered that earlier on. It's actually very confusing, because they say £30,000 of, of, of-, they don't make it clear, whether it is actually grant funding, or it's total project cost. It is total project costs for the two strands of engineering study, and the feasibility study. So you will have anywhere between £15,000 of funding, up to £7,000,000 of funding, for these two strands. They had-, this was actually the lowest cost, I thought it would be relevant,

Kellogg's, with £19,000 of IETF grants, secured for looking at heat recovery. They are looking at processes, are-, which are heat recovery, it marks really highly, the cooling systems, and that's why, you know, the food and food distribution are quite a number of sites that actually-, operations that have been successful. Because that's obviously a very energy-intensive process. The-, I think in, in Mettis, it was actually application of the capturing waste heat from the furnaces, and deploying them for bringing the furnaces to temperature, for the start of the, the new shift.

On the engineering study, there are three cases, case studies. These case studies we have put together into folders, and you can actually have-, they are there at Pro Enviro's desk over there. Please do take them, it would give you a flavour of what can be done, how you should proceed, how you should put together a successful application. Or if you do need to know more about the examples, all of these examples are covered in the, excuse me, final slide. Which is the-, covering all of the successful applications, and also what IETF's successful requirements are, and also explaining in more details, the whole of IETF requirements, so far as what DESNZ wants to actually-, so make sure you are aware of it. But one thing I want to-, one message I want to leave you with, before I finish. The process is-, if you plan it properly, the process is, is, is very sensible. The problem with it, is that as Matthew mentioned earlier on, it's assessed and evaluated by, bear in mind, by civil servants. So you need to be really prescriptive, and, and make sure that your submissions actually tick all of the boxes, as they have stipulated, and there is no reason for anything that would significantly reduce consumption (ph 22.39), especially if it is TLR eight and nine, you should not be successful. Thank you very much for your time.

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**Moderator questions in Bold,** Respondents in Regular text.

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Tom Marren: We're all looking forward to coffee, anyway. Thanks for the invite. I suppose I'll be probably more practical. We're an implementation type company, so we deliver projects through all the different, actually, actually, phases. What I will say, this is a great programme. I think it would be nice if it was speeded up, and it should be open all year round, but that's, that's still true. We found it very easy to navigate through and we found it very professional on the end. So, we operate as a company. We operated North and South and we operated in Scotland, and we're very, actually, focused. The one thing you did hear from the speakers is, 'Focus in on your projects.' So, we're very focused. We deal with renewable heat and we deal with renewable power, and that's what we do and we do that very well, or we tend to do it very well. So, what I'll do, I'll very quickly go through some case studies here and some practical applications what we've seen. On a positive note, this year, we will deliver somewhere between 12 and 15 million of grants for our customers. So, they are grants that are proved and true. So, we're very used to-, and all of this is-, so be it South or North or Scotland, they're all roughly the same. A lot of it comes down to this concept of abatement costs because of value for money, and that's a key driver, but also, that they can see that these projects are going to be delivered and they've been thought out. So again, if-, the previous speakers were, were brilliant at that. 'Focus in.' And you have to invest initially, but that initial feasibility is important. 'Does this make sense?' If it doesn't, walk away. And we're the same, because we don't invest our time if we don't think a project's gonna go ahead. So look, I'll very quickly go through what we do. Decarbonising industrial heat and electricity, that's, that's our only focus. Renewable heat and storage. Look, there's fantastic-, and I'll go through some. But renewable heat, we predominantly do industrial heat pumps and storage. Huge innovation in that, so large scale storage, and we've all this renewable energy that's curtailed in both here and certain-, and there's a lot of technology we can use for (ph 02.08) that.

Electrical storage. Well, renewable energy, we typically do that with actually on-site, actually, solar and large scale and storage, and there, we can fund or not fund it. That's probably not as applicable here, but we have a debt facility of 100 million into the company, and it's very low cost debt and it can range from four to twenty years depending on the technology, so that's a thing. So, just an overview of actually some of our customers. So, we're really spread around the food and dairy, the drinks, and the pharmaceutical. They're the main areas that we're-, we've, we've zoned in on. So, the, the pillars are Identify, Validate, and Implement. So again, I won't go over this because we've covered extremely well area sic , but that cost feasibility, then the engineering and then the implementation. I suppose we do each part of that, but very specialised, so like some of the previous speakers where it's spread across a load of different technologies, we're very focused on what we do. And the good thing about that, we very quickly can assess a feasibility of a heat project and we can very quickly-, we have our own engineering, we do our own feed and then



we can also implement as well. And very often, clients will want us to implement, and the reason being we'll give ten-year SLAs on the projects as well for availability, and some of the grants, it's ongoing monitoring. And potentially, they have the right to come back and take the money back if we don't do what we're going to do. So, having a ten-year that, that actually sits with us is important for clients. We also carry our own PI cover up to 10 million so we can fully wrap any projects, so that's very quickly. So again, look. Identify, Verify, and Deliver. We've been through all this theme, but that feasibility, they identified very quickly without spending a lot of money. 'Does this, or does it not?' One thing I will say, industrial heat pumps are by far the best technology I've seen, and I've been in the energy game for 30 years, and we've had business throughout the world. But it's really-, the technology has come up a huge amount and that makes really good economic sense. Then the verification. We'll go through some of the issues we might have then, and then, then the delivery.

I would say, industrial heat pumps, your biggest problem is gonna be capacity. We're already at booking capacity in the manufacturing companies for the technology, that's-, because it's not just here. Throughout Europe, people are understanding heat is a huge area we need to decarbonise, so the, the factories are just booked out, delivery times are going way out. So, that's an area I would say to watch. So, heat pumps, so heat pump technology. So, we, we don't do air source heat pumps. There's a lot of people in the market that have the technology, so we don't do it. So, we're industrial heat pumps, typically take waste energy is lovely-, and we go up to 200 degrees. But typically, there's a huge amount of heat up to about 100, 120 degrees. It's a huge amount of area that we tackle there. But aye, if we look at renewable heat, well, we're really at the lower end of the European average. So, heat is a huge driver for, for Ireland, England, Scotland, because we're so far down. Now, there's reasons for that. Some of the historical reasons (mw 05.06) between gas and electricity, wasn't there. But it is an area that we need to really drive. This is-, I could take this for any country and I just it up as a thing, but typically, that's a typical breakdown of our heat, where's our heat used. But as you see, typically, industry's a huge part of that, could be anywhere from 35 to 50% depending on the region. But of that, typically, we find about 50% of that industry (ph 05.33) is the technologies are there now that make economic sense. So, we're very much driven by, 'Does this make economic sense as much as carbon?' Most clients are economically-based, so. But that's what we find. So, a lot of-, and there's a huge scope here. And from a government-, and I, I would talk to governments a lot, it's very deliverable because, of that 52%, that's much more deliverable than, let's say, renewable heat in the residential, actually (ph 06.00), sector.

So, we're doing projects at the moment where the equivalent, installing heat pumps, and you see some of the case studies, might be 10,000 heat pumps at home, and we'll do one project in twelve months. Installing 10,000 heat pumps, needless to say, is extremely difficult. So, the governments-, across Europe, most governments see industrial heat is a huge play, and it needs to be supported, and I would say probably, faster (ph 06.25) . So, the heat cycle, I'll just-, what's, what's a heat pump? How does it work? The basic process, if we go back to our days, and probably most people in this room (inaudible 06.35) their A-levels. So, energy can't be created or destroyed. So, energy goes into a process, very seldom does the product come out hot, so somewhere, we're dumping the heat. So, our gas boilers come in and the product comes out typically cold, so where did that energy go? So, there's loads of waste heat. We always find substantial amounts of waste heat, be it we find it on chiller systems, exhaust systems, a huge amount

and then we put this through heat pump technology. Typically, our target COP-, CoP is co-efficient of performance, it's the amount of electrical power in to useful heat out.

So, typically, our target is a CoP of four, and that's all the projects we get, that's our target. And the reason-, there's economic reasons behind that, because of spar cap (ph 07.17) and that. So, we put one kilowatt of electrical power in and we get four kilowatts of useful heat out, that's CoP. But we have projects that are operating CoPs of even higher than that. We've combined CoPs of seven or eight where we might be doing chilling on one side and heat on the other side. So, we have projects at the moment that are producing chilled water at six, twelve, and hot water, 85 degrees, and the combined CoP in that might be five of six, so very good economic benefits. So that's how does it work. So, identify, we'll go in, like anything, you've all looked at this, and we look at our cooling. This is a particular project there (ph 07.50) , our heating and cooling loads, and we look at that and we will select technologies then to displace that. There-, this is a real study. We look-, we look to source. And so where do we get all the source? Well, we tend to get them sic chilling, schooling, towers, exhaust systems, all that. And then where do we put this heat? Because, we can gather all this (ph 08.08) , where do we put it down? So, boiler feeds, CIPs, hot water required (ph 08.13) and pass through the driers, AHUs. All this is where we might put it.

So, we're trying to balance, 'Where does heat go? Where do we get it from?' And we know the conversion technology and we know how efficient they would be. We arrive at-, we arrive at a concept design. So, they might say, 'Okay. Well, the concept design is this,' and we're really zoning in on the heat side and potentially on the renewable energy but this grant is more around heat. The good thing about the heat element here, as a cost of abatement, it's extremely good because heat is a really good-, a very good carbon saver and hence the cost per ton is, is, is very low and very often it does come back to those, to the metrics. How much does the government need to spend on the grant over the life-, over the lifecycle? And, look, but we would see project's in at ten to thirty pound a ton and that's extremely good over lifetime. So, that's a concept. Then, verification. So then, look, verification, very often we go onto sites. There's not sufficient information. So, we may have to put on ultrasonic heat meters and we-, extremely accurate but verification is really important for the next stage when you get to feed (ph 09.19), because we can look at gas bills coming in and they won't necessarily just accept the gas bills. They want to know where the heat is going. So, you need to look at, at different heat. So, verification is a big part. But there's great technologies here now. It's strap-on. We can be, be unbelievably accurate with these ultrasonic heat meters and extremely easy to put on. Implement. Right. So, we would then-, this is more the engineer, we would finalise the design. Finalise the carbon and financial, actually, modelling because most of our projects have to go into board level or some management (ph 09.50) to sign off. So, it's not just for the grant. These are projects that have to still get a sign off by, by the finances.

So, grant procedure, yeah, as I said, look, we've been very successful on our grants. Actually, every project we've gone for we've secured a grant. Now, that's very-, we're very-, I'll say that but we're very specific on the technology we go for but every-, and that's why we've been very successful on these.

Finalising the costing. So, we would go out, we'll do concept design, we go and price that in the markets and we know-, and, again, you talked about they want to see that, that this isn't a mythical number, we've come up with, ten million of CAPEX or five million. They actually-, so, we have to support that grant. Here's the, the three quotes or the one quote and here's the thing. And so, that's an important thing. And then, look, my talk is about a deep implementation. So, the challenges. Yeah. Look, the challenges. We would say the availability of data and the accuracy. So, we've seen accuracy out by-, you know, we look at the gas bills and you look at the heat uses, there's, there's actually 50% or 100% missing. So, that's, kind of, very important. The, the, the migration maybe from steam to heat can be definitely integration and the M&E integration can be-, can be really actually challenges. Potentially grid reinforcement costs. We've had projects that might have to go from a ten kV up to a 38 kV. So-, and that has its own cost and that. And then, operating the site parameters is important as well. So, just very quickly, case studies. As I said, we're, we're, we're practical. We're, we're design and build. So, here is a distillery in Galway. It's the first distillery in Europe that doesn't have any-, we're not burning any fossil fuel to produce whisky. And it's the first with a heat pump in Ireland and the UK that's operating at 120 degrees. So, this is operating. We produce 120 degrees under a pressurised system. We decided to stay away from heat. But it was interesting, we had to integrate with the process.

So, normally, your tilt is (ph 11.50) over here and process is there. But, to get this decarbonisation, your tilt (ph 11.56) needs, needs to meet process. So, we would have spent a lot of time, a lot of engineering, dealing with the process and understanding that. But the heat goes in there, we take the heat back at 60 degrees and over all that's operating at a COP of about 4.2. It's got huge press. It was the first-, you know, it's, it's-, we're not burning anything. There's no chimneys on it and there's no backup boilers or anything. So, that's it. And, again, storage becomes a huge part and that's why I said about storage becomes a huge part of heat pumps because-, and that particular reason the storage is-, when we put the heat in, we don't get the source back for about an hour and a half. So, we need to make sure there's that loop. But very often as well storage, especially thermal, it's very cheap and you can make a lot of money out of storage. Just to give you the scale of storage one project we're involved in, they're putting in-, we're putting in six-, they're ten meters by fifteen meters high storage tanks, thermal, and they're going to play the energy market. So, the one thing we're gonna find is, in the future, energy's gonna get very up and down for the next ten years as we go through this transition. So, we're gonna have-, there's negative pricing on the market at the moment. So, you can get paid to take part. So, we're able to utilise that by storage and that. So, storage becomes, yeah, a huge part of it. There's a project-, but electrical and thermal. There's one project we're involved in, just to give you the scale and really the way some-, now, this, it's a very big one but it's a-, it's a twenty megawatt solar farm and it's a ten megawatt battery and it's a huge-, it's heat pumps and it's storage but ultimately we'll decarbonise that site by 85%. So, it's, it's a huge project.

So, anyway, here, here's a dairy. So, this is a really interesting project. So, the drying industry operates at about 200 degrees, 210 degrees. So, typically you'd find heat pumps can't do that but when we analyse heat, yes, there's an element of that heat at 200 degrees but there's a lot of it that isn't. So, their pasteurisers, their, their CIPs, even pre-drying the air. So, we'll pre-dry that, that air, up to 100 degrees before it goes through the next process. But there's the result. We've, we've over a 50% gas reduction on that site. 9,000 tonnes actually saved. The equivalent-, and this is what I'm saying about governments are

really looking. The equivalent of that would be probably close to 5,000 homes-, installing 5,000 homes with heat pumps. Now, we all (inaudible 14.12) put heat pumps in at home but they're-, a lot of our housing stock isn't, isn't set for that. But the equivalent grant up here is probably about fourteen million if you had to do home heat pumps. In the South, it's closer to twenty million. So, even from a value for money for, for governments, industrial heat is the best value for money, decarbonising that. So, there's our distiller that buried down and that's, that's a four megawatt. So, that's, that's going-, that'll be commissioned in January. So, yeah, and that'll replace all their-, all their hot water. And, again, we're just tapping into the cooling tower there. There's a huge amount of wasted energy and we're just taking that and producing it like that.

Solar PV. Look, I won't go into this. There's Dale Farm, just up the road. That's a five megawatt solar farm. We installed that in 208 (ph 15.00). We're expanding out, and that's directly fed into, into the factory again. As we put in our heat, heat pumps, well, that's electric. So, how do we then-, because you're moving from, kind of, scope one into scope two and that. So, that's the reason that we do this. So, we, we design and, and build these out as well and we do a lot of-, there's the rooftop and-, there's where we'd look at the feasibility and, and that when we look at planning high, low (ph 15.28) and that. So, look, overall, that's the solar projects, how we might look at the-, look at the solar projects. And we either go and get third party land (talking over each other 15.37) but, anyway, this is more on that. And then, the financing is-, we could do it as a service or whatever. But, yeah. So, look, the take-aways, I would say the technologies are there. I would say-, and I spend a fair bit of time to, to senior managers (ph 15.51). I would say the first 50% to 70% of carbon reduction makes good economic sense. And I suppose that's, that's the message to get out there. This isn't-, it's just as a bi-product it's very good because we're getting carbon reduction but when you get into some of these technologies they make really good economic sense. And I suppose that's the message. And then, government needs to hear, 'Look, you need to support these from a capital to get this-, to get them moving.' And that whole area we need to-, like, if we're competing against America, who's driving down their cost of (mw 16.19), we can do this. And we've seen huge operational, actually, savings on these jobs, like, millions, and, okay, that's the big projects but even the small projects.

So, yeah, that's, that's my message. It's very doable, he governments are very open to it and the technologies are there. So-, because, remember, we invest in these ourselves. We have to give long term commitments. So, we don't take-, we look at technology and we see that they're not-, they're past a really high risk stage and that's what we do. Okay? Thank you.

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**Moderator questions in Bold**, Respondents in Regular text.

**KEY: Unable to decipher** = (inaudible + timecode), **Phonetic spelling** (ph) + timecode), **Missed word** = (mw + timecode), **Talking over each other** = (talking over each other + timecode).

Speaker1: It's good to be back here I did, I did chemical and food engineering at Queens University, so I did some milk processing then (mw 00.18), so it's always good to come back and see, see the place effectively transform itself. What I want to do now over the next few minutes really is to give a bit of an indication as to what we have been doing in CASE as part of a wider project across Northern Ireland because we've been on this journey towards de-carbonisation for a while now. The IETF funding forms part of that and we have in fact tried to support industry as well in going for those applications. And I share my colleagues' frustrations and pains effectively about being able to pull together applications, some of which were successful in terms of phase one and doing the feasibility, other ones which then failed because of the rulebooks and how well those interpreted by various different people. So there is, there is that aspect of it which we will touch on within the presentation as well. So overall what I've got here is, like, two points, one conclusion and some questions, it feels like the four weddings and the funeral type thing. But we've got is two points that I'm going to be starting to look at, one of those points being around the fact that we can start to work collaboratively in order to start looking at energy-type systems as a way to accelerate de-carbonisation.

What we have in Northern Ireland is a very large amount of very small companies which makes it very difficult for those industries to do something and what we're talking about here is aggregating up, you know, their needs effectively in order to be able to accelerate de-carbonisation across Northern Ireland as a whole. And then the second one, and this was again touched on earlier on is around partnerships and cooperation and really looking at the aggregated opportunity to deliver, you know, those projects for, again, for the success of the region. You know, out-, from the outset some of these competition-, these are not Northern Ireland competitions, we are not at competition with one another, you know, it's a UK-wide one, Scotland having to go off on their own. Okay, so effectively it's Northern Ireland versus England and Wales, alright, okay. And we can beat them in the rugby, so we need to be able to beat them in some of these energy projects as well. But overall the approach that we've been looking at effectively within Northern Ireland and we'll touch on this again, is we need to, kind of, you know, just aggregated effectively the CO2 emissions from the economy in order to be able to increase the economy and the productivity that we do and then reduce the emissions at the same time.

We need to pivot where we are using the technology and the innovation base in order to be able to allow us to do that. So CASE, just to kind of give you a bit of background on that, CASE is The Centre For Advanced Sustainable Energy. It is homed at Queens University where I'm from, okay, but it actually accounts for both Queens and Ulster University as well as AFBI. So we look after all of that, it was

funded initially under Investment Northern Ireland and more recently by DfE. But what it tries to do and it has been doing quite successfully is it leverages the leading-edge research, particularly within the institutions to deliver projects in support of Northern Ireland's energy ambitions. And it does that on the basis of working with that regional business community in order to be able to help them take those projects forward. Now the three areas that it has worked in would include things like bioenergy type projects, marine type energy projects as well as energy systems, and we have funded research again between regional and industry and academia in order to be able to deliver that across northern Ireland. Now from there, through the institutions, we're also able to tap into other sources of funding including EU funding to create centres for doctoral training which then train Ph.D. students up and so.

And the centre that we were successful in was called the Brighton Centre and that linked across into The Republic of Ireland in Letterkenny through Scotland as well as the EU, Queens and AFBI as well and we delivered a whole range of stuff. That included research outputs, okay, which may or may not be of interest to you all. Obviously interest to academic organisations but also it does a lot of things around the policy landscape, being able to position and understand where we're going. And one of the big things that I found in, you know, working across the UK with people is the, the role of universities, I think, and further and higher education sector within Northern Ireland is a lot more closely integrated with the regional industry here than it would be in other parts of the UK. I think that's fairly evident to me across the board in how the universities actually play, kind of, a thought leadership role across multiple areas including energy. And so how we can work together in the future in order to be able to make sure that we can access these great amounts funding. One of the examples, you know, that was done quite recently and something that we presented at various different conferences before was building that evidence base around the agricultural community.

So it's one of the big things for at the minute is asking that question about not necessarily, like, you know, how can we decarbonise farming but how can Agritech be a key component of decarbonising the whole of Northern Ireland? And that's the kind of questions that we're posing out there and as part of that case in building up that narrative, we went out to for instance look at decarbonisation on the gas grid. The heat demand that was touched on in earlier lectures and understanding the availability of those resources in order to be able to meet the regional gas demand. And that work in partnership with the utility companies, all of the gas companies effectively feeding into that study as well, particularly Phoenix. You know, was used to understand where we are in terms of the mapping, understand what the resources were and then to match both supply and demand. Leading to the, kind of, conclusion that if we were really active around the counters (ph 05.43) of, you know, capturing up the various feedstocks and processing those used in the various different technologies that we could probably lever in the region of 82% more if we were to capture other types of feedstocks at the same time.

Now the interesting thing about that and one of the important aspects of it is that that information is used then by the CCC, who then do the government and policy advice for the region as well. In other words, they were able to uplift their ambition for things like biogas within Northern Ireland in order to be able to

service regional demand needs. So the point here as I said is how the information that we can gather can build the evidence base to actually influence national as well as regional policy in particular areas. And that was in fact a successful project and we are working effectively, working together in partnership between academia and regional industry. Now as part of other projects that we have been able to then take through, we, we, we looked at Northern Ireland and said, 'Look, what if we were trying to create-', 'You know, the old Carlsberg ad, you know, the best place probably in the world to do Agritech, you know, probably. One of the things we went back to and it's like, 'What is it that we have been traditionally good at over a very long period of time? How could we take some of the skill base that we have and actually make a change in the regional economy?' And what's interesting is when you look back over history then, you know, there's this book here by Patrick Doyle talking about the cooperative moment across the Island of Ireland back then in the days in which it was formed.

You know, radical ideas from unfavourable circumstances bring together unlikely alliances of stakeholders. Leading to a new type of way of working for the development of things like cooperative creameries, rural banks, agricultural supply chains, and then using that information to basically go out and act as a showcase for the rest of the world including the US. And I mean it's interesting when you look over the time period there and relate it back now to the climate agenda or the Net Zero agenda and go, 'Is there an unfavourable circumstances that would require those kinds of communities to come together under a new way of thinking to develop new types of economies delivering success and acting as a showcase for the rest of the world?' Personally, I think we have the ability to do that. I mean that there's a challenge, do you believe it or not and if you do believe it then maybe there's things that we could do together in order to be able to maximise that opportunity. Where we were in that conversation was there were three things that I think that we're very good at in general, one is where very good at doing renewables, we were ahead of the game in being able to do that and deploy that, we've fallen behind. We're very good at manufacturing, okay, again ahead of the game, we've fallen behind. And Agritech, we're very good at but in terms of the climate agenda we're falling behind.

There's a real prize to me which sits at the centre of all of those, okay, and if we can basically combine renewables and manufacturing and Agritech, we have an ability to basically be a world leader. And that's where I think there's a real opportunity because not only does it help in terms of the overall economy but it helps drive towards decarbonisation and energy as a whole, that linkage between them all. So that idea of being able to work collaboratively and cooperatively effectively in terms of what we called these zero carbon cooperatives, you know, a movement effectively in being able to bring together the best ideas to deliver things. You know, the cooperative approach and partnerships effectively supporting the aggregation of various different resources giving us greater flexibility to maximise their value. That's something that we've identified that has worked very well historically and potentially could work very well in the future. If you're into physics and so on you all know about constructive and destructive interference, in other words, if things are matched together in the same kind of phase and you add them then you only make the things worse. But if they can put them slightly out of phase you can get one to basically mitigant against the other, and that's the type of thinking that we want to do around some of the energy and waste streams in order to then be able to create value across the board.

Is this idea that every business, every household, even as a nation what we have is materials and energy flowing into a box, materials and energy flowing out of that box? And some of all that is basically wasted, but when we look at that waste what we have is stuff which is useful to me as a business or a household or a whatever. Some of it's useful to other people and some of it's useful to nobody. And what we want to be able to then do within those situations is to maximise the return of anything that's of use to me back into that business or house. If it's useful to somebody else then let's give it to those people under some sort of an agreement. If it's useful to nobody then we have to minimise it as a whole and then make sure that we actually then come up with an overall system. This is still a very linear way of doing it but there's an opportunity to develop something which is a lot more circular. You know, clustering of industry, clustering of facilities, looking at co-owned services which actually do the facilitation of that waste management and allow this to then happen. It's that co-creation of new business which actually help to serve existing businesses in order to allow them to function and move forward in the future. New other industries, kind of, coming in are pivoting to essentially supply those industries in future as well.

That's the type of thing that we're talking about, not necessarily a circular economy but a spiral of growth, starting off somewhere under a green type agenda or energy agenda leading to new business and growing and growing the economy as an overall result. And there are different flavours of that then that apply all over the region, you know, a project in mid-Ulster is not going to be the same as a project in Fermanagh or project elsewhere. It might have all the same kind of common components, but what we can do is build that up into something different, different designs and different opportunities for growth. So that is now, sort of, happening because the kinds of ideas that are there my colleague Martin who's the, you know, the director of case is-, there's a pretty picture of him there, so he's down at the back. But it kind of gives you an idea of that kind of idea of cooperation now starting to happen, you know, where we've got some of the pre-type face studies and some of the other things which kind of going along with it. But you've got companies very, very close to here, alright, you passed them on the way up the road almost, you've got the Sembcorp, (mw 12.01), the Dale Farms all located in one specific area. What happens if they all come together, what happens if we have an AD-type system which is producing CO<sub>2</sub> and producing, you know, biomethane and producing digestives which could go to produce bio-coal, which could produce lots of different things?

It could help to decarbonise the cement industry, that cement industry helps to decarbonise the local paving block manufacturer, everybody wins under the kind of cluster-type arrangement. And what's interesting here is how those businesses, which never really spoke to each other in many ways other than to do financial transactions, are now talking to each other in terms of energy transactions and in terms of carbon transactions. Going to be able to then move those businesses forward. So this is a, a local region of work, again we've been able to work with them through the teams at CASE to essentially identify the opportunity for aggregating and basically saying where they could go in the future. Because what's the other option, what's the alternative to this as a region? And when we looked at it we, sort of, said, 'Look, they're smart.' There's lots of ways you can define smart if you're talking about objections, you know, specific and measurable. When we're talking about decarbonisation in the context of Northern Ireland we



talk about smarter, or at least when I talk about it for smart, am I actually asking businesses that cannot pivot and do decarbonisation or energy savings, are we gonna tell them that they have to shut? Are we gonna have to tell them that they have to moderate their activity so they only do the things that they can do with, within their own limitations of their carbon budgets?

Are they going to find alternative technologies or alternative ways to operate? Are they going to relocate certain core elements of their business or are they gonna to start implementing technological solutions in order to be able to then take them forward to where they need to be? These are the types of things that we have to ask and we have to do it in the context of the overall transition. Eugene's already outlined where we are and where we should be going in the next period of time. There's a massive difference and a massive gap, in other words, we're just kicking the can down the road and making that pain even harder at some point when it has to be done. I don't want to be there, I'm not gonna say that we don't have the technical capability, technology's already there but we need to be in a position to work together to deliver it. So let's talk then more specifically about energy and what the options are, and again when we've worked with companies around Northern Ireland this is a very simplified view of the types of things they do. Quite often you have a business, that business will pull in electricity or it will pull in a fossil fuel, it will basically use that to do a certain task, a lot of that energy gets wasted. In order to be able to save energy and the types of energy efficiencies we're now talking about under IETF include this.

You know, how might you integrate in solar panels for example onto your business to be able to reduce down your electricity but you still have the same kind of thing? Or you might move to CHP designs in order to be able to then use the fuel to generate the electricity and then you end up with an overall saving as a result. Or you might go all out, you might start integrating in solar and CHP with battery storage in order to be able to come up with a new system. This is what Spirit and other people are doing and many other businesses are doing the same kind of approach, but you have these different options. But we talk about when we're talking about clusters is well what happens if we take a business, for example, with a CHP which then combines up with another business with a CHP in a local area to be able to share that common resource, could share heat. What happens if we then link in some of the waste heat from that and dump it into a local heating network, using it for schools, hospitals and other leisure centre-type activities, and again you see options. What happens if those industries utilise their resources and space in order to be able to deploy solar panels, in order to be able to then go ahead and probably talk to someone about this as well, about the success we've seen across Northern Ireland in this type of thing.

So there's a collective way to think about energy and this system has a much better energy efficiency and lower cost than many others, can that be done? And then how does it link in with other, other renewable type systems including biogas production, you know, off-site wind energy and other off-site storage systems as part of a collective and cooperative in order to be able to drive forward energy savings overall? And then we start to take it to a new level, if we start to look at e-fuel production again using businesses and innovation across Northern Ireland, well we have to recognise that if we take electricity and make hydrogen we lose a lot of the energy. If we use that hydrogen to make fuels we lose a lot of that

energy as well, in other words, we end up with something that is a lot lower energy than what we started with and that's a problem. But if we start capturing that energy in things like waste heat and district heating network, so use heat pumps in order to be able to do the lift back up again. We recover an awful lot of that on the system, now starts to make economic as well as practical sense. If we take the oxygen and use it in wastewater treatment then we don't have a lot of these issues, because we can boost the capacity of existing wastewater treatment networks in order to be able to allow them to grow and get new businesses as well.

There is a systems approach to basically looking at energy and decarbonisation which then creates the greatest value for everybody, we can make the entire pie bigger, we can make the value much bigger as a result. And that's the type of thing that we're talking about when we're talking about energy guidance, how do we cluster or look at potential clusters of industries which take that smart grid type notion that is designed for electricity, but we apply it across multiple energy vectors. Apply it across heat, apply it across fuels and look at community integration where everything is now being serviced at a potentially local area, but everything can be then fed into a larger grid over time in order to be able to allow those clusters then basically be-, to be connected and to deliver economic success across the entire region. That's the type of thing that we're talking about when we talk about energy outlets. How do we take existing technology and using that to the best advantage of all the different people within a defined area to allow them to work cooperatively and get the success from that cooperative type engagement?

Because this is the type of thing when we talk about ITF funding and so on, and it's been mentioned many times, there are things around energy efficiencies and studies in deployment and there's, you know, the deep decarbonisation studies. And there's a lovely prize potentially on the table, 185 million pounds that could be available there for projects in order to be able to then deliver success in the future. You know, that's going to come out in early '24, but we've, we've heard the stories this is not so easy. It sounds fantastic but a bit like the Father Ted thing there is the dream and the reality of that dream, we might be dreaming of being able to access the money but I've been through this myself, I know the paperwork that civil servants love to have. And there is this, kind of, this seemed so much easier at the workshop when we were talking about it. And if you've ever done one of these applications they're not easy, okay, they do make them a bit difficult and they are looking for excuses to, sort of, pick people out.

But that does lead into, kind of, the Mo Farah bit here, okay, you know, don't dream of winning train for it. In other words, if we are position to basically-, or if we have ideas that we can probably take forward then we need to work together and get the support, you know, the universities and (inaudible 19.39) and others in order to be able to take them forward. But it leads to some of the issues and these are issues that we've found as well from our engagement with industry, and again this may or may not, you can tell me if it applies to you or not. I call it the bandwidth dilemma, what we find in northern Ireland is that there's an awful lot of businesses that have good ideas about what they would like to do but absolutely no time to pull together the applications of that, kind of, in order to be able to do it, okay? The people who have won these bids are the larger industries in Northern Ireland or the industries which actually has specific people

attributed to them who then go out and do this.

You know, the smaller-, the Catagens, for example, have people who are dedicated to basically doing this, but that does not apply across most businesses across Northern Ireland. We need to be able to work and how do we turn this 1% into something which is bigger. We had the value earlier on, like, if 100 thousand pounds is effectively what it takes imagine being in Kellogg's, 100 thousand pounds was the investment to get 19 thousand pounds potentially as a reward, you know. So that's-, only the bigger people can play in that space and we're playing against bigger people across the UK. We need to be smarter about how we do that. So the consequence of course of all of this is that larger firms, you know, with dedicated resources have tended to win versus the smaller one, we need to be smarter about how we do that.

So this is what I mean, like, okay, so we, we do have an ability, I think we can not necessarily cheat but I think we have the ability to basically work collaboratively in order to be able to find out who has the ace, who has the Jack, who has whatever. And find out how do we actually pull those together into a potentially successful and winning bid. You know, because it's been pointed out here already in earlier conversation, you know, if you want to get one of these you need to be investment ready because the time scales aren't really right in terms of being able to wait for that investment. You need to have your-, I, I'm going to make a decision now and I've got the money to do it. You need to have your supply chain ready in order to be able to deliver those projects within the time frame that's there. You need to have your planning and all of that ready to basically do it. All of these things, you have the resources to do it, you need to have the people who are actually going to go and deliver it, you have to-, all of that needs to happen. You need to have all the data in the bank to allow you to make the application in the first place. And even when you've got all of that there's no guarantee you're gonna win.

Because we again we've worked with companies who have even past thresholds on projects but didn't get the funding and we're left disappointed and frustrated because they had all of that work effectively done. It's a competition. So, but we want to try to support and help and make this the best opportunity for Northern Ireland to be able to draw down some of this and have success. So these are the questions I'm going to leave you with because others are gonna talk to some of it, but I'll let this stew in your brain because hopefully it'll come and help you with discussions even at the networking sessions. Are there common areas of need that we find across Northern Ireland that we should be then making bets on? Are the ways that we can work together and look at systems integration to work for you and for others around you, in order to be able to make the best projects so that we have the best chance of success? And how should we work with the limited capacity that we have to support projects, okay, in a way that's going to deliver the greatest success for Northern Island as a whole? So I will leave you with those questions and thanks for listening to me. So-,

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**Moderator questions in Bold**, Respondents in Regular text.

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Speaker1: Yeah, so what I'm gonna talk about is how you can make renewables work for you and how you can start to move forward in this journey. You'll hear common themes across what you've heard prior to me and hopefully, you'll start to see this conversion as David has started to outline very clearly for you. So just to give a little bit of background to us because I think it's relevant to this application question that has been put. My background is NIA, I worked for NIA for 30 years, everything from building power lines to running the customer service business as the director. And luckily enough, what I was allowed to do was to go off to Harvard Business School as part of my development and there they challenge you to say, 'What would disrupt your industry?' And what struck me was what would disrupt our industry is the ability to play two factors in the electricity market. The electricity rewards predictability and it rewards flexibility and I you can exploit that you can make more money for you and you can also address the other challenges we've talked about this morning.

So in 2017, guess what? After all that, I left them and set up my own company to do that along with my wife who's from the financial services industry. So we set off to do that. We got support from Invest NI with an R&D grant which we often say was the hardest £65,000 we ever earned in our lives. But the one thing about those processes is they're rigorous and they make you think very clearly about what it is you're doing and they make you articulate it. We then moved on in 2020-, oh, I've lost a note there somehow-, we set up Project Gerona (ph 01.59). We got that with support from Innovate UK. We got a £2.5 million grant from them to build the capability to run a smart grid and that's what we did up in Coleraine. And what we were doing there was having assets that are owned within customers' properties, saving electricity costs for them but also supporting the grid and doing that every single day. And that's the prize that I think is available for yourselves. Draw together the themes you've been hearing this morning and think about how you can do that. We've now moved on, we've moved into the centre of Belfast with a much larger team. We started as two, we're now up to 23 and we employ some phenomenally bright kids. They are incredibly sharp power engineers, data engineers and software engineers because that's another thing that we have in Northern Ireland which hasn't come through here.

We also have great IT skills available to us. Putting that together with the power engineering and all those other skills that we've talked about, that's very effective. Another point I should make is in 2022 we were approached by Heron Brothers (ph 03.12) who some of you may know a building company, quite big

players in the game. They also have a wind farm business and they took a stake in us because they see this as the way forward. So they want to be able to offer people like yourselves, well, I'll build your factory for you, I'll build your warehouse for you, I'll build your office block for you and we'll provide all the energy for you as well. 2023, we've clients now in Northern Ireland, Republic of Ireland, GB starting this month and tomorrow I'm heading off to Germany to hopefully sign an agreement to supply our services in Germany and potentially Spain as well. So that's what we're at and how we've got there. That is all about making use of our experience, our approach and our partners. And I particularly want to talk about partners here. We couldn't have got to where we are if we hadn't had Invest NI, UK RI. We've worked with University of Ulster, we've worked with (mw 04.16) in Queens and you've access to really, really good expertise there 'cause you cannot do all of this yourself.

You can partner with other companies and you're starting to see some very clever thinking from David and his team coming through there, so think about partnership. So what we do is we help you enable your CO2 reduction, we do end-to-end renewable energy for you, we do smart charging and I'll focus on that particularly this morning. And that opens up revenue streams, it allows you to manage your electricity more and also we provide you with some expert consultancy on the grid side of it and the, the power systems side of it. So the formula for us is we analyse and then we optimise and that gives you smart energy management. So let me go back to how electricity works. Electricity always has to match supply and demand and that's very difficult when demand starts to vary as you fire up your factory and he fires up his factory and down the back they've a swimming pool at their house and there are all of these things combined and it all comes off one grid. And what the grid does is it wants to buy in lots of electricity but it has to match all the time. So that's why the predictability is very valuable. If you can go out into that market knowing how much you want, when you want it, we can do that. That makes it much easier for you to procure at the best possible price. The flexibility comes because, excuse my French, shit happens, power lines go down, generator sets go down, different things happen and the network is always adjusting. I spent 30 years of my life living with that and that is a fact of life which will continue.

And here in Ireland, we're very lucky that we've lots of renewable energy but the wind doesn't always blow, the sun doesn't always shine and all of that unpredictability makes for opportunity for you if you can be predictable and flexible. So how do we do it? Well, what we do is we've built the system that we call PARIS which is the predictive analytical renewable integration system and it's all about integrating renewables into your business processes using predictability and flexibility to make the best use of every unit of electricity that you've generated or you've purchased from a renewable source. So we use big data with very, very smart systems built by very smart kids who design algorithms that optimise it all the time. So we know every second the, sort of, monitors that Tom was talking about earlier on, we do the same for electricity. So we don't just know what you've consumed and what you've generated on site, we also can predict that and we can also forecast the weather, taking in weather forecast and we also pull in the market prices 'cause as you know electricity's priced every half hour. Then what the software does is it decides what's the best thing for your site. And the first and cardinal rule is your site always has the electricity that it requires. I'm from an industry where we talk about demand-side management. I'm sure you've heard that term many times. I call that denial of service to many, so that's the grid saying, 'No, don't run your food processing plant. Turn down your fans, whatever.' You're there to run your business

and that's what's economical for you.

So the combination of data and battery storage allows you to have all the electricity you need but then you play that to get the best value out of it. Excuse me, my voice is not good today. So what the software really is saying is you've got a megawatt hour of electricity coming up, what should you do with it? Should you use it in the factory? Should you store it in the battery and use it later on? Should you trade it in the market place because our platform is telling you prices are gonna be really good in three hours from now? Or because you are very flexible, you can actually turn up or turn down your demand on the grid as the grid company wants you to do without compromising your process. And our platform is running all those calculations for you constantly and managing all of that for you. We then provide you with the software to-, so you can see all of that happening. You can also report on all of that and report on where exactly you have saved energy, saved CO2 and feed that as needs be up your supply chain to your customers who are demanding to see where you're reducing carbon. It also allows you to see where the electricity is being used within the, the site and that gives you the ability to zero in on where there's further efficiencies to be done.

Now, where you need to think about this sort of technology is alongside what Tom's been talking about, what David's been talking about and thinking about how you knit these things together for your own best advantage. We have some case studies which my, my colleague Glenn at the back will be happy to share with you but what I wanted to pull out in simple terms was the vertical skill here is how much electricity is being consumed on these sites and the horizontal access is where they've been able to self-generate. The little circles are showing you what the rate of return was and typically, this is between 15 and 20% internal rate of return. That's a very good return but also it's saving tonnes of CO2. So we've given you an office example, an agriculture, or an (mw 10.04) example and a manufacturing example. And the point is that there are savings to be made at whatever scale you're at. You don't have to have a ten-megawatt solar farm. The trick is to work it really hard against what your business needs so that's why that's a nice straight line up the middle there because what our software does and our analysis does is let you find the right amount of solar, the right amount of storage, the right amount of wind energy that you need to get the maximum value from your processes and from your investment. We'd be very happy to talk you through these case studies after the event. Here is an example of where we've done a study for a company who have multiple large dairy processing factories.

For some of you (ph 10.51), this may be a company that you know, Tom (ph 10.52). They also have a number of retail stores where they sell everything to farmers except food so it's posts and wire and (inaudible 11.01) so on and so forth. But they also have a cooperative of around 2,500 farms. And what a lot of people don't understand in the way the electricity grid works is if you can put in a fixed amount of electricity and draw off a known amount of electricity at the same time under control, the grid will allow you to do that which means you can be generating in one site, consuming in another, storing in both sites and running it under control so that you're always predictable and flexible within the grid. And that's the prize that's available because that allows you to maximise your processing cycles. You all know that

you'll have processing cycles in terms of your energy demand, you have different sites that have different characteristics and this was a significant piece of work that we did for them which they want to now push forward. What that allows them to do is from farms to factories get the maximum value but also crucially for them show where they're harvesting as much CO2 reduction as they can possibly get and factor that into the very significant challenges that they face as an agricultural processing company.

So just because I can't resist it because I've got a room full of captive people, we have a special promotion on at the moment which Glenn will be very happy to walk you through. But if you're interested in talking to us, we have a package available here where we'll do PV, wind, solar, storage and our PARIS platform. But PV, we're quoting here £35,000 to get you 20-kilowatt hours of solar, 20-, sorry, 20-kilowatt pay (ph 12.45) of solar, kilowatt hours, 20 of storage, and we'll install that and run our PARIS optimisation software for you. The reason we are pushing this is because the key thing you have to get started on is understanding your data and your data comes from your business processes. Your business processes, once you understand them and have the data, you have a very good starting point for the exercise that was talked about earlier on about applying for these grants and if you can save money along the way, all the better. But I'll leave you with a couple of thoughts, firstly, this is a long journey. If you get started in a controlled, organised way you'll know how to progress best on your journey. The second thing is from our own bitter experience and successful experience of securing very large grants from that government system, you've got to be organised, you've got to have data and you've got to have people working with you who know how to navigate the mindset of civil servants.

But the prize is enormous, you can put yourself in control and the thing that most of all makes your business successful is the fact that you have control of it. And you saw this last year and so what happens when electricity prices went through the roof, gas prices went through the roof and you were left a victim, a price taker in a very, very difficult situation. I you make the road-, the path down the road to renewables you can start to control that much more and then get very substantial value, control and direction going forward. So this is the, sort of, examples that we'll run through with you what people have generated and saved and so on and so forth. I'm passing that burden onto Glenn, he will be able to recite those for you. We will have-, you will have questions-, we I believe are taking questions later on. We'll be more than happy, we'll be here for a while at the back of the room if you wanna talk to us. But also if you're thinking about collaboration, what we bring to it is we're very good at managing the grid impact. And speaking as somebody who used to run the grid in Northern Ireland, the electricity grid is the one common factor here that you have to manage exceptionally well. You will start to see more and more of the fact that you import more than you should have or export more than you should have. You'll start to get penalised for that so you need to control that very, very tightly. This is the sort of approach-, not the only one-, but other players in this marketplace but this is all about control. This is how you make these things happen. I'll leave it at that point, okay?

Captions by Verbit Go

**File name:** invest\_ni\_-\_energy\_transformation\_event\_-\_chapter\_7\_-\_dr\_jim\_clarke\_(invest\_ni)  
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**Moderator questions in Bold**, Respondents in Regular text.

**KEY: Unable to decipher** = (inaudible + timecode), **Phonetic spelling** (ph) + timecode), **Missed word** = (mw + timecode), **Talking over each other** = (talking over each other + timecode).

Speaker1: Good afternoon, everyone. So I just want to give a, a brief overview of the services that the energy and resource efficiency team provide the companies and before I go forward I'd like to point out two of my colleagues in the audience, Gillian Stuart and Olga Scullion (ph 00.30) , if you could-, if you could stand up. And Gillian and Olga will be available later on to discuss the project support that I want to go through now. So, so basically energy and resource efficiency, as I say, just a brief overview of the services we provide. Now, what's the context of all of this? As the previous speakers have all pointed out, energy, it's a cost and I just to-, this little graph here, resource use raising with GDP, with economic growth, it simply isn't sustainable. I mean, we all know that and it's getting that message across and I think that message is getting across but it is possible to increase economic growth while decreasing resource consumption at the time. That graph is from the Club of Rome (ph 01.25) by the way. And energy efficiency policies, they do work. For example, UK energy consumption for 2005 to 2015, overall, energy consumption decreases in that time by just about 16%, petrol consumption, a 13.1% decrease, electricity consumption, over 15% in that time and natural gas consumption almost 33% in that time. And the context of that was that you had a 16% increase in economic growth at the same time.

So energy efficiency, energy consumption reduction is possible and you can still grow your business and you can still have a successful business. Again, another way of looking at this, those same energy efficiency policies from 2006 to 2018, a fall in U, UK energy consumption and at the same time UK energy consumption was 8% lower overall than it was in 1970. So in that same time, UK GDP tripled in that period for 1970 up to 2018. So it's possible to be smart with your energy consumption, in other words to reduce it but still at the same time increase your business profitability. So energy efficiency measures, now, this is the type of thing myself and my two colleagues were more than-, more than happy to talk about it after, after the event's over. So, for example, voltage optimisation, power factor correction, variable speed drives for motors, fuel-efficient management software, energy-efficient lighting, electricity tariff structure, for example, consume when cheapest. Cost-effective renewable energy supply that Abi alluded to there in the services that his company provide, demand side response, dynamic frequency response and insulation and, for example, simple things, just get used to reducing your temperatures.

Say, for example, the EU at the time when the energy prices went through the roof about two years ago, they had a-, they had a directive for all public sector buildings throughout the EU to reduce their temperatures to 19 degrees in all public sector-, all public sector buildings and that has worked. I don't know what the exact figure was there for what they saved but that just happened and if everybody did it-,



now, in the UK and here in Northern Ireland we talked about that but nothing happened and for the reasons you probably know well. But as I say, that-, it's doable if the will is there. So the context for business, at the end of the day, energy equal, equal to cost. At the end of the day, it's money. So you reduce your energy consumption, reduce your cost, improve productivity and at the end of the day, ultimately improve profitability. That's why you're all here at the end of the day. The green agenda is fantastic and we all are bought into it but at the end of the day you have to make money and save money, it's still the (ph 04.43) bottom line.

So just an overview of the services we provide. Just three programmes I want to look through here. We have a consultancy programme, we do run a resource efficiency capital grant every year and we hope to have an energy efficiency scheme up and running some time next year. So the consultancy programme, we offer a programme which is free for up to 6.5 days to clients and non-clients. The only criterium is that you're annual resource spend is at least £30,000. That could be energy and or material consumption. The client or the non-client will discuss a project with a technical advisor which would be myself or my two colleagues which are present, Gillian and Olga. The advisor will write then a technical specification based on the customer requirements, followed by tender submission for a consultant appointment. Now, at the moment our next new framework will hopefully become live on 10th October, that'll be next week. It runs every four years. The previous one ended there on 30th September and we hope to have the new one live on, as I say, 10th October and there'll be at least twenty consultants on that framework. So after the specification is written up and provided the, the company is happy with it then that is submitted for a consultant appointment and the tender is based on methodology and the price. The project is then completed and the report submitted initially to (ph 06.31) the client. Now, typically that will take about-, between initial discussion and report being available about six to eight weeks. Typically, it can be about ten weeks.

So I wanna talk about the resource efficiency capital grant. Now, that focuses on material efficiency, not energy efficiency. For example, if you want to reduce material scrap in your business, you want to reduce your material input going into your business, that's the type of areas that it covers. And the next call will be April and May 2024 and they always have to have this writer (ph 07.09) subject to budget because the way things are at the moment. But we offer-, the grant offers up to 30% grant support towards projects that improve material efficiency. The maximum grant is £50,000 per project so one project per year per company. Applications are competitively assessed against that criteria. That would be pay back, that would be your capital cost over your material savings. That has to be between one or four years.

Speaker 1: Your position on what's called the waste hierarchy, a commitment to invest the balance of funding and correct information on applications. Now, one of the services we do offer is that we will help applicants with the-, on their application form because even though it's quite straight forward, it's I suppose pointed out earlier, smaller companies especially, won't have the time and the resource to devote to filling in quite detailed application forms and that where we would come in, to give you assistance on that. Now, the Northern Ireland Energy Efficiency Scheme, the terms of reference are still being finalised on that. We hope to have the launch date sometime next year, unfortunately, I can't be more specific than

that. Now, from what I've heard it'll be worth at least £15 million over a five year period. That's something to look out for. Now, to give you a bit of context on that to compare what went before, we had energy efficiency capital grant that ran from June to October 2021 and that was basically a COVID scheme to help companies get up and running again after the pandemic.

That particular scheme offered £80,000 worth of maximum grant. It was 20% of the project cost and the company size then was not a restriction. Now, that may change because the terms of reference, as I say, have to be finalised. The amount of grant offered may depend on the company size. We don't know yet, but hopefully, we'll get those questions resolved in the next month or so. We also offer sustainability and carbon footprint assessments. Sustainability assessments say for example, in terms of the energy and material inputs into your business, what they are now or what you can do to reduce them going forward. We also look at scope one, two and three carbon footprint assessments in terms the greenhouse gas protocol, whether-, what they are based on and then obviously, if you have issues or difficulties in assessing your carbon footprint by scope, then the consultants will help you as far as possible to in other words, recommend methods to improve your carbon footprint.

So, what are the benefits for business of these programmes over the last few years? For the period 2015 to 2023 our projects have identified at least £50 million in cost savings to business. That's identified cost savings. Companies have realised at least £12 million worth in terms of cost savings and for the same-, for the period 2020 to 2023 for example, identified carbon savings of 27,500 tons. Now, that's becoming more and more important, as you would realise because more and more companies now are asking for carbon footprint assessments because their supply chains and their customers are now demanding it. So, that's becoming now very popular with our schemes and again, the consultancy framework that I talked about earlier, that basically will cover those carbon footprint and sustainability assessments. So, if I go back a little wee bit to this, this consultancy programme, if you wanted to say whether it does happen, the energy efficiency scheme, you can get a project done now for a project you may identify. Say, for example, to reduce your energy consumption. With this scheme here, which is free, as I say for up to six and a half days, you will then have a set of numbers together which will then prepare you for the grant application when it does come out.

So, that's the-, that's a key advantage of getting a report like this done for your business. And again, you can also use this consultancy programme to prepare for a resource efficiency capital grant application whereby, if you identify say, a more efficient say, injection mould press for example, that uses-, reduces less scrap, or zero scrap in some cases and reduces your input material, you can then get a project, consultancy project done now, which will prepare a set of numbers for you and then that will boost the chances of you then getting the grant. As I say, it's comparably assessed. So, basically, that's a very brief overview of the services that we offer and as I say, myself, Gillian and Olga are very happy to discuss any projects that you may have in mind going forward. Thank you very much.

Captions by Verbit Go



**File name:** invest\_ni\_-\_energy\_transformation\_event\_-\_chapter\_8\_-\_richard\_pelan\_(invest\_ni)  
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**Moderator questions in Bold**, Respondents in Regular text.

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Richard Pelan: Good afternoon, everyone. I'm Richard Pelan from the R&D team in Invest NI. So I think what we've heard today has been really excellent, the, the, the combination of technologies, funding mechanisms, the previous applications, the expertise has been really, really useful and even more broadly useful than even a planned IETF. But that's, that's primarily what we're, we're here for today so the-, I wanna talk through what funding we have that can help you make that application but again, it's, it's, it's R&D funding so it's more broad than just looking at the IETF. We have a, a mechanism called Project Definition which helps you apply to funding either our grant for R&D, internally Invest NI or another external funding body like Innovate UK or indeed the IETF. And I think the-, how it links then our grant for R&D or our R&D team with the IETF is that element of transformation so it's not just your normal resource or energy efficiency although I think what Jim outlined there with the consultancy support is a really good first step to get you in the way of thinking. But it is things that are gonna transform your, your business processes that that's the kind of project they wanna see under the IETF. So I think it's really important to remember that transformational bit within it that it is something that's not just your normal iterative improvement, it's something more substantial than that. That's what they wanna see, that's what they're investing in. They wanna see the value for money for the investment and that transformation happening through that investment as well.

So, yes, I'm gonna talk through the support that we have for that but then more broadly as part of that process, you know, I'm more than happy to work with companies through the application, you know, and give feedback on drafts before it goes in, help make connections to consultants or the KTN, Knowledge Transfer Network within Innovate UK to try and develop proposals and support them through that process really. Sorry, I'm as blind as a bat, I can't see. The-, so the, the final point, the one really important thing is to avail (ph 03.07) of the project definition support you do need to be an Invest NI client company. That's the, the only, sort of, caveat with it. But if you are planning for it and you're not an Invest NI client company I'm more than happy to still help you with the drafts and look over the drafts. That's free of charge, there's, there's, there's, there's no cost associated with my time. So what we can support through the Project Definition and primarily is your time to spend the time internally looking at the project, making that application. And it is really, really difficult as has been outlined today, the, the two steps before making an application for the deployment either of an energy efficiency project or a deep de-carbonisation project is the feasibility study and the engineering study. To make an application to the deployment stage they basically expect you to have all that information that you've done a feasibility study and you've done the engineering study and you have all the support and information to put in that application as well.

So the level of detail that's required if you're going to the deployment level application is really quite onerous. It's not straightforward, it does take a lot of work but there is good returns on the, the other side for the investment side of things. And there's-, David was saying a dedicated resource is typically available in the large companies but this is where consultants can come in and help you with the expertise to bring it into your company to help with your application. So we can support consultancy costs of anybody externally that's working on the project as well. The, the other thing then is that for-, if there's any legal agreements, collaborative agreements or if you need to do any sort of legal searches and things like that as part of the project definition, we can help with the costs of that. If there's any travel and accommodation, if you need to go talk to key customers, key suppliers to help what you're-, develop what you're doing in the R&D project or, sorry, in the application, we can help with the costs of that as well.

So the main deliverable from a project definition will be the application for whatever stage you wanna go to. It wouldn't be-, it wouldn't be typical that we would support a feasibility study but I think everything above a feasibility study could fall under the Project Definition. The other thing then is if you have previously applied and failed with IETF and would like to apply again even if you've had Project Definition before if you can show that there, you know-, the feedback-, based on the feedback you need to do more new, more intense work to make a successful bid this time then we can help hopefully support you again with another Project Definition to make that application again. So, that, that's it. That's all I've gotta say. Very short and sweet. If anybody has any questions on our support or anything like that there (ph 06.54) we'll as Eugene says-, we'll be down the back, happy to take any questions and help in any way with your applications. And thank you again for everyone coming along tonight. Thank you.