

IETF Podcast, Episode 3 – Richard Pyatt & Animesh Ghosh

Narrator: Connecting for positive change.

Jenni McDonnell: Hello, and welcome back to our industrial decarbonisation podcast series, highlighting the progress being made towards net zero and, in particular, the Industrial Energy Transformation Fund provided by the Department for Business, Energy and Industrial Strategy. My name is Jenni McDonnell, and the podcast series is brought to you today by Innovate UK's KTN.

Jenni McDonnell: The purpose of this podcast series is to encourage the permanent deployment of industrial energy efficiency and decarbonisation technologies with support from the IETF fund. The fund is providing capital investment to industrial sites in England, Wales and Northern Ireland to help them to reduce the energy demand and the carbon emissions associated with their industrial processes, which can be very energy intensive.

Jenni McDonnell: A link to the competition guidance for this fund can be found on the KTN website through the link in the description below, and you can sign up to receive newsletters and updates on the IETF funding there too. You'll also find links to earlier episodes of this podcast series. So, the first podcast discussed the policies and standards that are encouraging industrial decarbonisation. And, in the second podcast, we spoke to some of the industrial sites about what they are doing to reach net zero.

Jenni McDonnell: For today's podcast, we are looking at how delivery partners could help to advise industrial sites on how to reduce their energy demand and carbon emissions. And, I'm very pleased to say we have joining me today, for our third and final podcast, Richard Pyatt from CR Plus and Animesh Ghosh from Enviryra. So, hello to you both, would you like to introduce yourselves and explain a little bit about the role you have within your organisation?

Animesh Ghosh: Hi, I'm the managing director at Enviryra and what we look at is a full turnkey solution for clients, right from conceptualisation, feasibility measurements, and execution of projects to help clients with their turnkey solution for energy reduction and carbon reduction, with the verification at the end, through to PAS2060.

Jenni McDonnell: That's great. Thanks very much, Animesh. And, Richard?

Richard Pyatt: Hi, Jenni. Thanks very much for inviting me on to the podcast. So, I'm Richard, I'm Director of Energy and Engineering Consultancy, CR Plus Limited. We undertake projects and surveys on industrial sites across the country. I've been with CR Plus for 15 years and in that time I've undertaken a raft of different projects focused, not just on energy reduction, but also on things like operational improvements, such as speeding up production processes, improving quality, solving maintenance problems. We do this across a range of industry, focusing primarily on foundation industries, but we also work with lighter manufacturing projects, not solely about energy.

Richard Pyatt: We recently completed an interesting recycled water project that reduced water based emissions and delivered some energy and consumable savings. And, during the last two to three years, CR Plus has grown in supporting the industrial cluster decarbonisation. We're currently the lead partner on SWIC the South Wales industrial cluster planning project and we're a technical partner on re-powering the Black Country, which is the West Midlands based industrial cluster planning project, which I lead for. And, within these, we're looking at all sorts of innovative concepts, including electrification, hydrogen, eMethonal, small-scale carbon capture utilisation, many others. And, importantly, we're trying to explore clean growth and reshoring of industry via local symbiotic, energy and materials hubs, and trying to bring in the circular economy aspects to, um, industrial decarbonisation.

Jenni McDonnell: Well, thank you both very much for coming along to share your experience of the IETF with us.

Jenni McDonnell: Let's get started by setting the scene for our listeners. So, Animesh, could you explain the importance of industrial decarbonisation to the industrial sectors? Is it simply a matter of being the right thing to do, or is it more of a fundamental need to allow them, their businesses to survive and grow?

Animesh Ghosh: I would say it's both really, it's not one or the other, kind of thing. Companies, as they evolve, should be taking the right steps predominantly from an environmental perspective as part of decarbonisation for the benefit of everybody. However, there's a fundamental step as well, which you've highlighted, and that should be there to actually promote the energy reduction and the decarbonisation initiatives and the successes of the clients and, and the industry sectors.

Animesh Ghosh: And, and this should be done for the benefits of their clients and their customer base. So, people can see that their products are actually of a lower carbon content or net zero. I believe there is a government strategy on this, but what we look at as part of the decarbonisation strategy is, what is the client's vision? Where do they want to go? And, at Envirya, what we do is then we build that so we, we meet the, the greener future requirements for the client and, and their manufacturing processes and products. What we do is, we work with the clients and we actually develop a very robust, decarbonization strategy, a roadmap, if you will, that is achievable. It's not just a hypothetical one that, yes, we'll meet net zero, but it's the path to getting to net zero with KPIs throughout, between now and 2050 or 2030, depending on what can and can't be done on that specific site for that client.

Animesh Ghosh: A lot of the strategy is based on our engineers going in with their experience, on to the sites, and actually doing a high level of measurements and verifications and actually see what the carbon performance is of the client, and how we would start to reduce that. As we go through that process with the client. We then measure it in accordance with PAS2060, which is a BSI specification for demonstrating carbon neutrality.

Animesh Ghosh: So, it's a very public document, you can add it to your account, and it also allows the client to transparently see where they're going and what they're doing and how they're achieving things. Typically, with the strategy we look at the carbon pricing as a tool for the accounts, so we can compare against how much is that carbon costing you, you are producing that carbon and how would that equate to, if you invest in projects to reduce that carbon? So, it's, it's evaluating that for the client. We help the clients work in, in producing policies and frameworks. So, part of that is, fuel-switching in the first instance, in terms of changing from fossil fuels to low carbon alternatives and we look at, not just switch by the provider, but also we look at hydrogen, electricity generation, biomass systems, all generations of low carbon alternatives in ex, in, in, in sort of reducing the fossil fuel part of it.

Jenni McDonnell: So, thanks Animesh. I know that many sites need help to understand where their energy is being used and where their carbon emissions are being generated as a first step before they apply into the IETF. So, that's good to hear that you're able to offer that support.

Jenni McDonnell: Richard, I know you have worked with many industrial sites, supporting them to understand how they can reach their net zero carbon goals. Could you offer some advice to our listeners on how to approach industrial decarbonisation and where would you start?

Richard Pyatt: Yeah, I mean, first thing to say is I, I agree entirely with, with what Animesh just said there. I mean, we, we would always aim to start at high level industrial decarbonisation, it isn't just a problem for engineers, it's a problem, it's an economic problem, a political problem, an environmental problem. So, we'd always advise by starting with the questions to the business. What's your strategy? Where do you wanna take the business? What options are there for you to exploit? What risks do you foresee needing mitigation? Do you have, for example, major assets or plant that are on a replacement cycle you've got coming up? And also, what's becoming more important at the moment is to start to look more strategically and understand what's happening outside of your boundary both in terms of infrastructure for energy, but in terms of growth and use of land, cause that can play an important part into the decisions that you might make. So, once that's better understood, at that point then, specific projects can start to be conceptualised in-line with those strategies and where you wanna take the business.

Richard Pyatt: This should always be a clear business case. Obviously, no business really would invest in something that doesn't have some form of return. However, the business case is, will be wider than just a simple energy payback. So, say you're a, you're a tier one supplier to supermarkets, you'll be coming under increasing pressure to demonstrate your decarbonisation and wider sustainability plans. You might have competitors entering the market, the, we've gotta watch out for market distortion at the moment because, the way that decarbonisation is sort of evolving, you've got this cluster approach where there's a focus on carbon capture storage and hydrogen generation starting with the Track one clusters up in the Northeast and west of the country.

Richard Pyatt: So, being aware of things like that can, can come into your, your thinking. What I like about IETF is, it doesn't have a, a regional bias and offers distributed sites the opportunity to do something now. So, sort of create their own destiny, if you like. And, I've seen some neat examples of, of onsite fuel switching, for example, where remote sites can actually start to do something rather than sit back and say, "well, I've gotta wait until infrastructure does something for me".

Richard Pyatt: Within the industrial decarbonisation clusters, work that I mentioned with South Wales and, and the Black Country, we're promoting a, what we call a 'Five steps of Decarbonisation', sort of a, a hierarchy, where we've got resource and energy efficiency first, then fuel switching, then onsite generation and smart networks, then carbon capture utilisation and finally, carbon capture storage. It's important to distinguish between those last two, because, again, coming to back to policy there's, there's sequestration of storage of CO₂ from industry in the, in the geological stores offshore, but there's some neat utilisation opportunities at smaller scale as well that are now starting to emerge. So, as I said, we placed efficiency at the top, which is, which is always, is always gonna be the case.

Richard Pyatt: Some examples in the Midlands recently, where there's 50 to 80% efficiency improvements on the site. So, go at that first, before you start saying, how can I change my gas to hydrogen? For example, we did a study in South Wales region for the National Grid sponsored, Zero 2050 project and, we came up with a, from, from the sample industry mix that, that were in involved, we came up with a 9 to 18% thermal efficiency reduction opportunity and a 4 to 12% electrical efficiency reduction. And, as I've said, there'll be, there'll be, all sorts of other examples below and above that, depending on their specific situation and historical levels of investment. For example, efficiency has come into sharp focus recently, of course, with the volatile and high energy prices, a number of projects, projects that we've put on the table for people in the last decade have been parked are now coming back, coming back up to the top, unsurprisingly so, going beyond the efficiency, I mentioned fuel switching. Okay. Onsite generation might be something that people might look at before fuel switching, if it's say, solar PV, for example, but when it comes to fuel switching, something we've started to work on is, is the, the fact almost, that there's the skills and resources challenge. There just aren't the, aren't the resource, the people to actually work on the industrial demand side to actually implement a fuel switching solution. So, it's one thing for policy, for example, to look at hydrogen supply, it's a generation and supply, but it's a totally different thing to then say, how am I gonna apply this and use it on my process? Particularly if it's like a direct fired process, like a, like a furnace.

Richard Pyatt: I've mentioned already, but yeah, advising businesses more and more to understand that the sort of strategic infrastructural challenges that are going on outside of their boundary is becoming more and more important. And, that's where we've found that we're, we are sort of now helping that more, that interaction with the, with the network operators for gas and electricity and, and linking to, to policy. And, I generally just advise, just to sort of look wider than your, than your boundary in terms- you speak to your trade associations and, and, and others within your sector and, bit of promotion, Jenni, likes of the KTN. There's, there's lots of useful resources and learnings from what others are doing, and

what's actually going on out there in a, in a time that's, that's, there's so much change happening it can be very hard to keep up. So, that would be my sort of overview advisory.

Jenni McDonnell: Well, thanks very much for the plug Richard. Absolutely right, we are here to help at KTN. So that is, it's really about finding time to understand their energy demand that can be challenging for those smaller sites and it's really good to hear that there are consultants like yourself, and like Envirya, who can help with that.

Jenni McDonnell: So, obviously this podcast series is promoting the capital investment funding that's available from the IETF. Animesh, I was wondering if you could give a few examples of the types of technology that can deliver those energy and carbon savings for industrial sites? Can you share an example of an IETF project that Envirya's been supporting?

Animesh Ghosh: Sure. As I think we've, we've, we've all discussed before, we do start with any of the projects. First, we'll obviously undertake the surveys on the site and, and then we look for the optimisation approach first, through their engineers, with their technical expertise and their, you know, experience in the field, to do the more simple aspects of what's needed before we move onto the projects, because that can always, it's a holistic view. Otherwise, we could move down the project where it might be an overkill, where we should do the optimisation first and hit the low hanging fruit, if you will. In addition to that, we always work on the, on the PAS2060s, the scope one, the scope two and, and, and we work with the clients through workshop tutorials to actually understand, what is it that they want to achieve? Similar to what Richard has highlighted as well, what does the client want to achieve before we go down the IETF grants and the projects so, we know exactly what we can apply for and what we can do. And, predominantly, it's to do with scope one that we focus as the direct users or the issues on the site kind of thing towards the projects.

Animesh Ghosh: Before we start that, even before we look at the IETF grants or anything, we'll submeter on our own platform. We'll analyse the half hourly data on specific plant and equipment and, and we'll look at the typical things such as the ovens, the furnaces, the ID ratings on motors, pumps, compressed air systems, if they're being utilised, how's the HVAC working, BMS controls and, and all sorts of things around the plant to see how that best is optimised. Before we start with any grant work, then we'll sit with the client and we'll look at bespoke projects. They're not just a generic off the shelf, it has to be bespoke and specific and tailored for the client's facility and their demands and requirements for decarbonisation and energy savings. Once we've got into that kind of stage, then we can look at the actual projects that comply with the IETF grants and where that works. So, there's no point looking at a project that there is no grant availability for, kind of thing.

Animesh Ghosh: So, so you look at it from that perspective and, and these range from heat transfer systems, re-utilisation of dissipated energies through regeneration, we'll look at solar and wind. I, I understand they're not part of the grant aspects, but so we, we look at a range and then we say to the client, with these particular projects, you can go towards the grant and it's viable and it's worth pursuing. So, cause it takes that time and effort and we want to be able to make sure that there is that probability of being able to attain it.

Animesh Ghosh: So the, with respect to lots of the projects, we'll look at bio-gas, carbon offsets, you know, tree planting and other things that the client can do for carbon offset. And then on the grant basis, we've actually successfully completed quite a lot of projects with various clients and, with IETF grants, so thanks for that. So, with some of the IETF grants that we've successfully been awarded, one of them has been to do with specific submetering with artificial intelligence that focuses on process optimisation and energy saving. And, that's been very successful in actually highlighting the energy savings that can be done specifically for a grant project.

Animesh Ghosh: Other projects we've looked at are high efficiency motors, where the client wasn't fully aware of how much energy it was costing on a equivalent motor. So, these have been highlighted and changed through. We've looked at the food industry clients, ovens and their burners, how they operate, how they're used and grants being available in terms of those feasibility for execution. Other areas we've looked at is battery charging as well, not necessarily new batteries, but also how the battery is being charged. How old is it? How is it working efficiently? What is it charging? When is it charging as well? Based on tariffs. So, these have been very good projects that have all saved the respective clients, substantial savings and reduced their carbons, kind of thing.

Animesh Ghosh: In addition to that, we've also been applying for other clients grants, which, I believe are to be awarded. I think they're just going through due diligence at the moment, and this is more to do with biomass systems and bio energy systems on a client's site, specifically to generate their own energy as well so, this is a really good step for those particular clients, kind of thing.

Jenni McDonnell: Well, thanks for that, Animesh. It just shows some of the great examples and, and a huge range of technology that can be deployed with IETF support. And, Richard, would you also like to share an example of an IETF project that CR plus has supported?

Richard Pyatt: Yeah, okay, I've got an example of a feasibility from phase one, example of an energy efficiency deployment from phase one. So, the feasibility was with a, a company, a site called Firs Steel, a subsidiary of, of William King, metal service centre based in the West Midlands. Their process is a coil coating so the main, the main energy use is natural gas into ovens and a thermal oxidiser. So, our involvement began with an energy survey, I suppose, that, that identified fairly significant potential for reduction based on control and based on heat recovery. So, when the IETF came along it gave the opportunity for the feasibility because you've got the situation of processes. This is, this is quite common processes that you can't just go and get all of the nice up-to-date, clean information from, from drawings and data. You need to understand some of the nuances of, of the line and the nuances of, how, how things have operated and how they've evolved over time as well. The IETF study, the feasibility study allows as, as a, as a, as a subcontractor within that term, within that work, then working with the actual site themselves to conduct like a lot of like risk and opportunity type exercises, bringing a lot of resource from the actual plant themselves, operators, maintenance, technical people to actually bring out some of the, some of the information that would otherwise, you wouldn't, you wouldn't have necessarily been aware of before you then go and specify new equipment.

Richard Pyatt: And, we were also enabled to conduct a lot of measurements. So, ourselves, we did a lot of the airflow and temperature measurements, for flow temperature pressure to actually model and, and put the system into different conditions and see what the actual improvements, what the changes were, which were then fed into helping specifications.

Richard Pyatt: So, it was a successful study completed earlier this year, the, the outcomes then were a, phase one, to actually go and implement some quick win control based improvements, based on turndown, which we're actually, one of my colleagues is helping them do in July and August this year. So, that should get sort of somewhere towards 10% reduction. Just from that quick win step, then a phase two, is about a bigger chunk of recovery, from a heat recovery, back to the process and that's then hopefully be going to, going to the IETF for, for deployment as a follow on, to then do that project next year and then that tease up for a phase three, which would be some residual heat recovery then to things like space heating, some, some, product, product environmental heating. So, avoiding condensation of some of the product and things like that, which the ultimate goal is to get a, I said earlier... Energy efficiency can have a, a huge range the, the potential here is about an 80% reduction in the natural gas, gas use on site, just from those energy efficiency measures.

Richard Pyatt: The deployment example is where there a large steel works, down in South Wales then, Celsa manufacturing, they process scrap steel in a, an electric arc furnace and then, that melted cast billet then is used to make construction products like steel sections and rebar. So, they've got a project underway, ongoing to put in a static variable compensator that effectively balances out some of the, the fluctuating reactive power and load associated with the arc furnace and the energy efficiency comes from the, the, the production related, sort of, efficiency of how much time it takes to melt the steel. So, it improves that that use of that electricity and the melting process fundamentally and we, we've been helping that one as, although the former, we were more, the technical expert on-site and undertaking that, all that work we're, we are undertaking more of a, a project and delivery support role, where we're interacting with the, the technical experts and the, particularly the main technology provider there and, and overcoming challenges. Like, for example, there was a challenge around locating of the equipment that, that had to be solved. So, we were involved in, in that sort of thing. It's not always a technical energy, creative problem when it comes to deployment of, of projects. It's, it's a good one. I mean, it helps with local distribution and transmission as well.

Richard Pyatt: I mean, obviously if we're going to electrify industry, plus other sectors, then there's gonna be an infrastructure challenge around that to actually have the capacity to supply that extra, that extra headroom. And, what we're hoping for then is to focus next on the decarbonisation of the, the thermal processes cause they've got a, you know, significant gas use in the reheating of the, of the billets. So, we're hoping that we can then start to focus on that next, which then could involve hydrogen, possibly electrolytic, hence the potential need for, electro potential, extra electricity in the region there.

Jenni McDonnell: And finally, a question for you both. Do you think the policies and support being provided by government for industrial decarbonisation is hitting the mark? from your discussions with the different manufacturing sectors? Are you getting the sense that it's

helping them to reach net zero carbon or, in your opinion, is there more that could be done to support them? Richard, would you like to go first on that one?

Richard Pyatt: Yeah, the main challenge is always gonna be integration of policy and action. I think it's a, whether it's a fact or whether it's an opinion, that net zero is complex. So, trying to oversimplify it often can lead to sort of putting policy into, into distinct boxes. And, then you have unintended consequence, unintended bad policy, but also you could have distortion of markets and, and competition. Like I said, with the industrial decarbonisation of clusters, you're going to have opportunity for those in certain parts of the country that isn't, isn't then an opportunity for others. So, that's always gonna be a, a tricky one. There's a, there's also a chicken and egg dilemma when it comes to the alternatives for fossil fuels. Do you, do you ask the end users what's best for your process? Is it electrification? An alternative gas such as hydrogen? There's other, there's other options, of course that would seem the best way around, but then it comes back to, but okay, our process, it's not, cost-effective to electrify or, we don't have that infrastructure, but equally our process would work well with a switch to hydrogen, but again, same, same challenges.

Richard Pyatt: The reverse is that you almost let policy lead and then end users have to react to those changes, which is, wouldn't normally be the best way around, but it seems to be the only option for, for some, hence maybe their best position is to focus on, on efficiency first. In terms of grant support, the, say that the breadth and scope of the IETF has, has been generally really well, well received a lot of positive feedback. It's allowed people to sort of actually look at things that they otherwise might have just sat and waited on, to just almost see what happens. And it's allowed projects that were sort of just too far outside of that investible range to then be, to then be progressed. We have had feedback on smaller companies with maybe less resource in house, smaller capital projects that have struggled to utilise the funds due to the complexity of the scheme, the minimum grant threshold, that sort of thing.

Richard Pyatt: Timing of support's always crucial so businesses often have the capital approval systems and it can be mismatched to actually assign and agree their match funding in line with the windows of bids, seems to be an element of luck over judgment sometimes there. Plus, it's, is helping to support that. I'd say it's, it's slowly accepting and, and recognizing that to try and support that sort of thing.

Jenni McDonnell: And Animesh, are you hearing the same sort of positive feedback from industrial sites? Is the capital investment working or would maybe tax incentives or some other form of support be of interest to the sites you've been talking to?

Animesh Ghosh: Sure. Yeah, and Richard's mentioned a lot of valid points there, which he's absolutely right on and, and I think an agreement to that. Yes. The policy is leading the way because it's directing companies into what they have to achieve. Otherwise, as we've said, it takes longer because it's not an urgency. So, so the policies do help in that respect. I think with the, the grant availabilities, these have been very positively taken on board by companies, but a lot of the time they haven't always been fully aware of it. Or, if they have been aware, they've found that it's quite a lengthy process or a technical process and

actually having to do the feasibility to be able to apply for the grant... So, it's not just as simple as apply the grant. You have to do a level of energy feasibility first to get-

Jenni McDonnell: Like the energy modeling?

Animesh Ghosh: Correct. Yes. Without that, yes. Without that, you can't really fill the grant application. So, a lot of companies are stuck there in the first instance, in terms of, I don't know what I'm applying for...

Jenni McDonnell: Yeah.

Animesh Ghosh: ...And, I don't know how to apply for it. So, we, we, we try and sit down with them when we try and, as we mentioned before, the processes of what they can and can't do and how we achieve the feasibility first. So that's been, really good I think. I think the other key things is, it's quite specific in terms of, for example, the SIC codes or the, the areas that it, I don't know, it's mainly industrial sectors, but we've come across a lot of clients mainly say, site hotels or leisure facilities, large facilities, where there will have the cooking, they will have the heating, they will have the cooling, all the same things you'll have on a manufacturing site but done on the leisure site and they, they're struggling to understand they could get grants or they, they do fall into the categories but they don't meet the SIC code requirements. So, unless there's other grants that we don't know about, there's, there's that area where they also want to become net zero, but can't afford the CapEx kind of thing.

Animesh Ghosh: What we found is that the grant has helped where we've executed them. The clients have been really appreciative of the IETF funding that they received. Because, I think, without them, in a lot of cases, the justification to even do the feasibility seemed quite high. So, with that IETF funding, knowing that it will lead to the execution going forward, it's been a very positive approach. But I think, as Richard, as I said, there is a complexity to getting to net zero because it's not the same for every client. They have a lot of factors to consider, where they sit within the market competitiveness, the cost of doing this, the time scales associated with it. So, these all have an impact, kind of thing. And, we do speak to a lot of manufacturers and they just fall beneath the thresholds, especially the feasibility or even some of the executions, and that, that's a little bit unfortunate at the stage. So, if there's an opportunity to broaden that slightly, I think there's a, there's a larger range of companies just below the threshold who could, would benefit with the carbon reduction grants as well.

Jenni McDonnell: So, you're talking about the minimum grant threshold?

Animesh Ghosh: Yes, the threshold. I think when we've put the projects together, they sometimes, they just fall under the thresholds and then it's quite disappointing that there's an opportunity here...

Jenni McDonnell: Yeah.

Animesh Ghosh: ...But they're just not expensive enough, which is not the way we want to work, if you know what I mean? So, so those are some of the areas and like I said, there are other areas outside direct manufacturing who undertake similar plants and equipment and energy generation, which I think are worth considering as well, you know?

Jenni McDonnell: That's, it's good feedback. Yeah, so just to be clear, the, the scope of the IETF, for our listeners, to be eligible to lead one of these projects, you do have to have an eligible standard industrial classification code, as Animesh mentioned, and that tends to be the manufacturing sectors, mining and quarrying, recycling of materials like metal, and data centers. So, unfortunately, yes, the, the retail and leisure sectors are not eligible to apply to the fund, but it's good feedback to receive. So, if those projects are out there, we will feed that back to BEIS to help them to structure new funds. So, thank you both very much for that, very constructive ideas in there.

Jenni McDonnell: Unfortunately, I need to bring that discussion to a close now. But, thank you so much to both Richard and Animesh, it's been great to have you with us today and learn about some of the progress that's being made in industrial decarbonisation in the UK.

Jenni McDonnell: Thank you to everyone for listening, any links mentioned today, such as the guidance for the IETF fund and newsletters for the KTN website, they've been added to the description below, so don't forget to sign up and receive those updates on the IETF. We hope that you found the industrial decarbonisation podcast informative and we hope it's encouraged you to take advantage of the government funding that is available this year. So, thanks again for listening and goodbye.