File name: adrian_watson-_industrial_transformation_webinar___invest_ni (720p).mp4

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).

Adrian Watson: My name's Andrew Watson, of Project Design Engineers based in Antrim, we're an engineering design consultancy who have worked within the energy sector. This presentation is on designing the transition from fossil fuels to low-carbon technologies. A little bit about project design is you start over-, start off with. The company is founded in 1989, it's basically we work throughout the UK, Republic of Ireland and Europe. And we are now part of the Fingleton White (ph 00.36) group of companies. In Antrim we have 25 people and an additional 112 throughout Ireland, that's part of Fingleton White. We're multidisciplinary engineering team, and we're professional engineers. The services we provide are front-end engineering, budget and estimating, site-support procurement tendering, design and construction safety management, detailed design specification drawings, (mw 01.03) design and build construction management, and project technical commercial vision. We've also got ISO 9001, ISO 14001, and ISO 45001. As I said, we're an engineering design consultancy, and basically we started really in the oil industry supporting it and that was in 1989. But obviously we have since-, there's change happening with climate change and environmental legislation. So where we have worked with the new oil industry and we still do that because it still needs support and still is a, an important fuel for Ireland, and then-, and the UK. But there is that transition which is moving across into other projects. So within the oil industry we've done everything from minor to major changes, to also complete brownfields, excuse me, seabed (ph 02.03) upper-tier combined oil terminals which are-, we have constructed and designed two of.

We have also been heavily involved in the energy-, battery energy storage systems, better known as BES, within Northern Ireland and in the UK. To date we have had projects which have installed over 220MW, and that's over seven projects. We also have another 72MW currently in planning, for two projects. And we are also currently developing 200MW-plus of storage throughout the-, Ireland. We also as part of the transition to renewable fuels, we have been involved with hydrogen generation storage and refuelling for road transport and, and fuel cells. PDE has been involved with the hydrogen-refuelling system, HRS, for the-, for Translink, for their buses. And hydrogen generation for (inaudible 03.05) for Energia, which is going to be supplying the, the buses. We're also in the process of developing a number of larger projects, one of them up to 14MW of electrolysers, with 8.5 tonne of hydrogen storage, truck-filling facilities, and fuel cells for electricity generation. Those are technically the projects that we have been involved in and they're currently working on. But as in all types of engineering we have seen there's been challenges and there's obviously advantages going into these technologies. So as previously said, we, we work within the oil industry but climate change and environmental legislation aims to reduce the dependence on fossil fuels for heat, power generation and transport. Therefore developing a no-carbon environment. PDE as a company realised that we had to embrace the new technologies as well as support the oil industry.

As previously said, the oil industry is still going to be with us for a period of time and if you consider Northern Ireland, 68% of houses are actually heated by oil, and that's going to take a time period to actually transfer to a renewable source. PDE already had extensive experience of working within hazardous areas dealing with the control of major assets and hazards which is the COMAH regulations. And some of these skills are transferable to your low-carbon energy technologies. Typically hydrogen, hydrogen's a very volatile fuel, but within the proper-controlled environments, it can be safely managed. In the battery-energy storage systems, which was our first transfer move into renewable fuels, we basically had to reskill and retrain our workforce to look at the requirements off that battery-energy storage systems. BES's technology has challenges of, of some of the (inaudible 05.00) have caused fires and those have been basically quite a lot of internet coverage on those fires. You'll-, and this has caused public and consultancy resistance to some of these projects which impacts on planning. This is one of the issues, is trying to get these projects up and running, and some people have had, you know (ph 05.23), considerable time in planning. And that's something that I think that needs to be addressed so that these projects can actually get into actual work on, you know, a more expedient way. Also the technology providers are continuously developing the systems to improve safety and efficiency. You know, that is something that the earlier technologies and some of the battery chemistries have had issues with, as I say, fires. But most technology providers now are going for lithium iron phosphate, which is a safer technology and it basically is a non-combustible technology that-, so we wouldn't have the potential of fire.

BES also has the advantage of stabilising the electricity network. One of the issues is obviously seeing large demands coming on the network and battery-energy storage has the advantage that it can be switched on very quickly, it can actually put a load onto the grid, or it can actually put a supply onto the grid. So, where there is a, a peak demand, it comes in very quickly, typically storage will be anywhere between half an hour and two hours. But it will actually support the grid therefore not-, no need for actual turbines to actually run up to support it. Same if there is a dip in the actual demand, the actual battery storage can be switched on to charge, therefore stabilising the, the grid. Hydrogen is relatively new in UK and Ireland and to date we, we are using USPS (ph 07.07) guidance and for its design safety ports. Typically that's NFPA 2 versus ISO 19808-, 80 and those are developing design codes and no doubt that the UK and Europe will, will catch up and will adopt those codes. We would like to see-, we would see this as a form of energy becoming more proper with transport injection to the gas networks. There's also advantage of harnessing for its yield wind power to generate hydrogen. And we would see this very much for your wind farms, this is a win-win situation. So when they are in a situation where they are-, the, the wind is curtailed, and not required on the grid for grid support, that could also-, that could then be used for powering electrolysers which would be for hydrogen generation. That hydrogen generation, like I said, can be used for road transport fuels, it can be used for injection into the gas main, therefore putting in renewable source into gas. And it can also be used then going back into fuel cells which then can go back into electricity.

So we, we, would say that there is a shift very much so from where PDE started to where it is today. But

as, as previously said we are embracing these technologies, we see this is the future. We see that fossil fuels will ultimately disappear, timescale, I'm not sure but what that's going to be. But we will see what the might of battery storage-, so to date we've been involved with 320MW, and there's, there's several hundred megawatts are coming behind that. Hydrogen, we can see that it is definitely happening. As I say, one of the projects is 14MW of electrolysers that we're looking at. But it, it needs to be that those technologies are raised by consultees (ph 09.16) and the public. And realise these can be safe methods of actually providing energy therefore in essence to keep the, the country moving, and also to keep the lights on. That, that typically-, that is basically my, my presentation. As I said, it is the answer of shift from the fossil fuels to, to low-carbon technologies. These are ever-developing very quickly and they will need to be embraced by, by the potential users and end-users. And also one thing we have to be very aware-, wary of is that the rest of the world is doing this as well. And if, if Northern Ireland and, and UK, and Republic of Ireland don't actually get moving in these quickly, we're going to end up going further and further down the order lists. We are already finding this with battery storage, that to try and get a experienced delivery of batteries is difficult because there is so much demand worldwide. It's the same it's going to be with electrolysers, so there, there's only so many companies who are actually providing these technologies at present. That will obviously expand, but one of the issues is actually being able to get that technology when we need it, so we can get to a low-carbon technology energy provide-, provision.