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Introductory Jingle

Innovate UK KTM connecting for positive change.

Matt

Welcome to the Maritime Innovation Sound Waves Podcast. In this series we'll be exploring the trending topics that innovators in the ports and maritime sectors are always talking about. Following the success of the decarbonising ports and harbours innovation network, we reaffirmed our commitment to decarbonising our industries including maritime, a lot has happened since 2019, but the maritime sector is now rising to global and domestic grand challenges addressing the transition away from fossil fuels to net zero operation, along with an ambitious plan to embrace automation, digitisation, and striving to improve productivity. We have assembled teams of leading experts in their fields drawn from our Maritime Import Innovation Network to join us today related to these grand challenges. In this episode, myself, Matthew Moss, Maritime Leader, Innovate UK KTN are joined by guests Elly Howe and Jerry Clark from Portsmouth International Port, as well as Marlene Mitchell from the Port of Aberdeen, and today we'll be exploring the topic of green ports. So welcome all. The first question, I'll go to Elly, you first. So ports have been leading the charge when it comes to creating the green ports of the future. Tell us about some of the decarbonisation initiatives that are happening in Portsmouth International Port. Nice, easy one to kick us off.

Elly

So here at Portsmouth International Port, we've been working on our decarbonisation journey for a fair few years, especially with Jerry here at the port banging their sustainability drum for many years. And so a few ones that I think are important to call out are a few projects that have come to fruition within the last year or so. So that includes our Solar Arrays project where we have over 2600 solar panels now installed across the port in our 1.2 megawatt peak system. We've been included and worked collaboratively on the shape UK project, on the Pezzo project which both came to an end in the last year or so. We have five air quality monitors which form part of our digital twin ecosystem here at the port giving us live data every day on what are air quality, pollutant measurements and weather data across the site, which is great. It's all even in our infrastructure as well. So we have a terminal building that has won awards for its sustainability credits within the building, things like a sea water harvesting pump, wind cows on the roof, and we are currently building a huge extension to that terminal building which boasts similar and better efficiency measures. And we'll be carbon neutral upon construction. And then I suppose the biggest thing that we've been working on and continuing to work towards is around the ships that we welcome here to Portsmouth. So we work really, really closely with Brittany Ferries, they're our biggest customer. And over the last couple of years, we've welcomed and started to welcome LNG vessels into the port. So Salamanca, which was last year, and then last Friday, there's San Toner. And so these are, you know, these vessels, they do boast a much greater impact when it comes to air quality. They're carbon emissions, you know, it's a step change for this type of vessel. Carbon emissions are still an issue, however, we do have a next step towards that as well, which is us welcoming two LNG hybrid vessels from 2025, which is really, really exciting for us. So these vessels are the world's first ferries of that kind, and they'll be able to switch to battery propulsion from their LNG engines. So when they're coming into the

harbour, passing the city into our ports, they'll be producing zero emissions, and we're hoping to be able to provide them with shore power. And we're working really, really tirelessly on those aims at the moment. I think that's a pretty good scoop of the things that we've been working on the last couple of years and months unless I've missed anything, Jerry.

Jerry

No, that's all good. I mean, I was having a bit of a laugh and a joke with Elly earlier that I started in 1994 in the port. Elly was born in the same year that I started in the ports. So it gives you an idea of one generation to the next. And a lot of what we've done, Elly has just spoken about but one of the great things that came through was the sea water heat transfer pump, which cools the new, I say new - 2010. The terminal in the summer and heats it in the winter, sea water flushing everything we've done in the last 20 years, everything I've done that hasn't been piloting ships, has been towards increasing sustainability but no, Elly's hit them all on the head there.

Matt

Thanks very much, Elly and Jerry. I mean, there's a whole range of projects going on at Portsmouth at the moment, and it sounds like there's plenty more to come, which is quite the challenge as we go through this transition. So moving on to Marlene at the port of Aberdeen the same question to you really. What activities/initiatives have you been involved in at the port of Aberdeen around decarbonisation?

Marlene

Crikey, it's quite an act to follow Elly. But in Aberdeen, we have set ourselves a really ambitious target to be net zero by 2040. So that's ahead of the Scottish and UK government targets. And over the last few years, we've been involved in a number of studies and initiatives that will work towards incremental gains and you know, larger step change gains. Within our North harboured operation some of the projects that we've been involved in that have already started driving benefits are; the introduction of electric vehicles, and we've got more due into the fleet this year, and in coming years, as the current fleet moves through its useful life cycle. We also spent around 300,000 pounds replacing almost 500 lights across the port state with energy efficient LEDs. So that reduced energy consumption for lighting by about 50% almost immediately, which was, you know, a huge huge change and a huge benefit. It also drives efficiencies in terms of maintenance, reducing working at height, and it drives a better operating environment so it's better for everyone who's working in the port. We're also involved in a number of projects supported by CMCD funding, including the Airport Zero project, which is focusing on our almost fully operational South Harbour Expansion project, and that is focusing on accelerating our transition to net zero. We're looking to decarbonise landside and maritime operations through green alternative power sources. We're looking at multiple energy vectors there and we're considering a short, medium and long term range there, as well as technologies to power port equipment and third party owned equipment operating on the land side. So that's a marine and landside project, which is really exciting. We're also involved with the High Five Consortium, looking at domestic green shipping corridors, linking Aberdeen with Orkney and Shetland Islands initially, were the hydrogen powered autonomous ships, moving volumes of cargo there. So we're moving through that on again, another CMDC project. And just one other that comes to the top of my head is, still strong, we're working alongside the AP Moeller Maersk spin off organisation and we're looking at the development of offshore charging buoys for hybrid and

or electric vessels that are out with the harbour itself, but within the port limits. So that's just a few of the projects we were involved in, or we have a strategic, sustainable operating group within the portO focused across every element of what we do from operations, Marine Engineering, and Scheck. This is just a building block element to help us as we decarbonise before 2040.

Matt

Thanks very much, Marlene. And I think both from Aberdeen and Portsmouth perspective, we've really got the ball rolling in terms of getting these transformational, let's be honest, in terms of infrastructure, huge transformational projects underway. I guess the next question would be what is the biggest challenge for you as port owners/operators to get these projects off the ground? Because in some cases, we're talking about vast sums of money. Maybe there's many stakeholders at play. We'll come to give first Elly and Jerry, what's been the biggest challenge for you so far, to begin this journey of decarbonisation?

Jerry

Well, it's always the money to be honest, when it comes to it. But the challenge is, I'm not saying they're not there. But it's just hard work, which I think we're all used to. Certainly the LNG ships, we have a customer that's been in Portsmouth for over 30 years. We didn't go to them and say, we need you to buy more sustainable ships. They've done that as part of their own drive. Our job is to make sure we put the infrastructure in, so that those ships can actually work. So, for the new ships that are coming in currently, in 2018, we put in a brand new linkspan, which joins the ship to the shore. Now, half a million of that was sustainability features that were funded by one of my closing, one of our closing European Blitz, but that allowed us to put in soft start electric motors, special paint steel that will last 35 years rather than 25 years. But more importantly, by having a tank that was pumped out by water, electric pumps rather than the air blowers we used to use, we managed an 11% energy savings. Unfortunately, one of the first things that goes out of the window when you do a project, is the sustainability features when the budget starts getting squeezed, but having external funding for those is what makes the difference. And that's where Innovate UK, UKRI and the Knowledge Network itself and the collaborators that we've had throughout, have helped. The solar arrays that we've put in are almost a commercial arrangement while like putting one on your own roof, it pays for itself after a few years. So the challenge there is not so much the project itself, as putting all the bits and pieces together. We've had two very successful projects in Pacor, which is energy systems optimization, which was funded by UKRI. And the reason CMDC bid, Shape, which was the hydrogen project. Three strands to that which really opened our eyes. The challenge for me as a bloke is now 60 years understanding the technology, which is why it's a delight to have Elly. Because what we put in there was a digital platform that did a digital twin of the port. And from going from a project where we think well, that sounds nice, it's now becoming an essential part of how we're going to move forward, because the digital twin already has on its dashboard, our air quality monitors. It's going to have our energy use and it's going to have a conversion to carbon on it. So the thing about Portsmouth, it's owned by the people in Portsmouth. So whilst carbon reduction is our aim, air quality improvement is an even higher aim, because our stakeholders are the people of Portsmouth. So, I've got a boss, the port director who said to 'use the port, so we're going to be putting those air quality monitor readings out onto the public sphere very shortly. The biggest challenge at the moment is shore power, as I'm sure you will understand. The challenge there is the lack of a business plan. So Simon Bullock did a study

for the Tyndall Centre at Manchester University some time ago. We were one of the three subject ports. I think it was ourselves, Tyneside and perhaps Dover. And the challenges haven't changed from when he produced that paper. And the great thing is, well I mean, we've got the Zebby funding, the Zebby competition starting for which we're going to be putting in a bid. And without that, I can't say we're doing it because ports have to be commercial, they have to be commercially orientated. And without the funding that is needed to get it off the ground, we can't see a way of putting a business plan together to make it work. And the challenge there is then if you do put it in and you want to recharge for the cost of putting it in, you need owners who will pay for it. And when an owner that can produce electricity on his ships massively more cheaply than you could provide at shore, then that's the biggest challenge we have at the moment. There's other challenges in the future. But we have got great partners in Brittany Ferries. We've been doing more and more collaboration with Portsmouth University and with the Knowledge Networks. So yeah, the challenge at the moment is definitely shore power.

Matt

Thanks very much, Jerry. And yes, I think to summarise there perhaps as well as your technical skills, that is a challenge for the future when we go all digital, more money, please, from the government to help with these initiatives and more collaboration and engagement with stakeholders to drive these projects forward. So moving on to you Marlene, you've got a different operating model at Aberdeen compared to the local authority owned Portsmouth Port. So perhaps tell us a little bit about your biggest challenges Aberdeen getting these projects off the ground?

Marlene

Sure, well I mean, there's multiple challenges but just listening to Jerry talking there, our challenges are identical. We're a trust port as opposed to a local authority port, but at the same time, we have the commitment to our communities and the hinterland around us to basically pass the port on in a better position than it was as we inherited it as a team. One thing we do have though, is the ability to control and streamline our business case requirements as opposed to a limited company. But at the same time, we still have the same challenges. Shore power is something that we're very much focused on, as I think many ports will know. We've done a lot of work again with the Tyndall Centre and we've done a lot of analytics. But even just a phase one introduction is a multi million pound investment. And there can be a lot of uncertainty over demand. So you can, you know, you can build it, but will they come? is often the sort of cry. And we've done a lot of work around that working with stakeholders, vessel owners and such like. But there's conflicting challenges. You know, as a port, we're very focused on our net zero ambitions, our port users are too, but they have different ambitions, and are not necessarily in the same place, at the same time as us. So we've been working through that, and moving forward to try and align. So again, as Jeremy alluded to the CMDC, Zebby funding, you know, it's undoubtedly a great help. The process, as we know, is quite challenging. The timelines can be quite challenging and I do know that it can be for SMEs and smaller partners, an issue to free up resources to be able to get a really robust bid completed on time or completed to the best of their abilities. And then on top of that, the vessel owners also have their business case requirements, they have to show a return on investment. And certainly the market that we support in Aberdeen, which has been supporting the oil and gas energy sector, they've been operating for many years at lower margins than they would have liked. Which does usually mean that r&d and

investment is what gets cut first. So they have to be able to present a business case to their management teams to support upgrades. And then again, it all comes down to cost. How much is it going to cost to be able to use shore power, and it kind of moves us into the policy conversation as well. There's a lack of clear direction in terms of policy. Right now, the clean maritime plan from 2019 was great, but it really didn't point to any direct regulation, or to any economic stimulus that would drive the uptake of these new technologies. You know, it's cheaper to use an NGO than it is to use electricity from the grid. So you know, there's lots of great positive things that are happening, but there's still challenges there. And really, we need to see some stronger policy drives. And maybe that will come, as we get the new Clean Maritime Plan revision later this year. UK Shore is definitely doing a great job in supporting the sector as a whole. But we do need more government help to drive these decarbonisation initiatives, because I have not yet seen one that comes free of charge. And the ports often have to bear the brunt of that cost, particularly if it's an infrastructure upgrade. And for many of us, ports are not new. Although Aberdeen obviously we have new and old. But there's a cost associated with infrastructure upgrades, but also dealing with ageing infrastructure. And as well as your upgrading and maintaining on a regular basis, when you're having to dig up key elements of your key site, there's a challenge there from a civil engineering perspective and such like and we don't always know what's ahead of us there. What else? Let me think about what else are the challenges? Grid connectivity, do we want to touch on that at this point? We're lucky in Aberdeen, many other ports are not, I'm quite aware of that. They're at the end of a grid connection and they don't necessarily have that grid connectivity to drive the uptake of some of these technologies that need enhanced power solutions. But as I say, Aberdeen is very lucky. We do have good grid connectivity and we're going to maximise that moving forward.

Matt

Thanks very much, Marlene. I think if we were to do a PESTEL analysis on some of the challenges that ports face, we could tick off one of every single one of the PESTEL analysis, there are challenges in all areas. Perhaps a follow on question from something you mentioned, then around the policy. Would you see it a greater benefit to ports having that clear policy direction? Or would more cash in terms of these funding competitions be most important to you now as you start to develop infrastructure for the future? Or would you say they both need to be developed in tandem?

Marlene

So that's a really good question. Honestly, I think the funding would come first, simply because everything has a price attached to it. A lot of r&d has gone into the development of technologies. Some technologies are not at the same TRL level and so need more support, more engagement, more development before they become a true accessible solution. Policy will be great and we do need an element of that but at the same time, if we push too hard on policy, we may actually damage our business and the sector, because some organisations may actually just choose not to do business with UK PLC, if it's too onerous in terms of policy requirements. So, there's a fine balance to be met there and that's obviously where we're going to be reliant on the likes of UK Shore, the catapults IUK in bridging that gap and understanding what the art of the possible really is without damaging our business models moving forward.

Matt

Thanks very much and apologies - curveball question that wasn't in the planned original content, so it's always a nice surprise for the audience to get some spontaneous responses there. So, as we've got about five minutes left of the podcast, I'm going to move on to our final question, which is, as the ports and maritime sector is an international sector, we obviously play in a global market, do you yourselves as port owners operators, keep a close eye on what the rest of the world is doing, first and foremost? And then, where do you see the UK in this international market? Are we at the forefront, pioneering some of the latest technologies? Are we perhaps fast followers? Or are we flagging behind some of our international counterparts? So I'll go to Elly and Jerry first.

Jerry

Internationally, we're not really an international port. We're a mere continental port. We do have international trade, mostly involving bananas, we still import about 50% of the UK's bananas through Portsmouth. But that's a falling trade. As containerisation takes a bigger and bigger bite out of those. Our relationships really revolve around our main customer, Brittany Ferries and as I say that, when they invest 100 million pounds in new ships, we're there to provide the infrastructure for them. As far as what's happening internationally? Well, yes, we have to be aware of that. More particularly around things like ship indexing, and the cost of carbon trading. One of the things that again I mention Mike Sellers, it's good to have a boss who says "go out there and laboritise the port because he lets me do anything I like. I didn't actually ask him for any money, which means that I can do anything I like, provided I get a grant for it, which is where the air quality monitors came from. Now, the interesting part is that the government asked for ports that didn't want the million tonnes of cargo a year to produce port air quality plans, which we did, and it was then rescinded because the big ports took the blue team and decided they didn't want to. Now we discovered that of the roughly 60,000 tonnes of carbon we produce each year, 26,000 tonnes of that is from ships sat alongside not plugged in, actually using their own generators to produce electricity, while they're not doing anything of economic benefit. This is laying by, this isn't while they're actually doing anything. So we've got 26,000 tonnes a year and the current price in Europe of carbon is about 85 Euros a tonne. So it doesn't need me to tell you how much that's actually going to cost when we start paying for it. Now, ships are going to start paying for it, from I think, January next year, so we're keeping tabs on this. We've got shipowners coming into Portsmouth as some of the **** ships you can imagine, that are actually asking us to produce, give them shore power, which I know they can't take because they're desperate to reduce their carbon index level. And this is something Elly and I were talking about. We have to decide if we're going to produce electricity shore side power to these ships, do we try and provide them for the older vessels that probably won't retrofit anyway, or do we go for the newer vessels? Well, the answer is we're going to try and provide electricity to anyone who can actually take it. We have a letter of understanding from the managing director of Naval Caledonia for his two small cruise liners, which do Aberdeen as well, I believe. But the older girls, the older ships, they actually have spikes in their requirement for electricity that doubles their level that you have to provide, just to account for the spikes. It's not a level of draw that they're taking. So, we're going to provide all those. We have to keep an eye on internationally what's happening because we're going to get all caught out if we don't. One of the interesting things is that if you're going to invest 20 million pounds in shore power, it is going to be 20 million because we don't want it to be 30 million, which is actually what it would cost to put in what we would really like. Then we had to talk to the ship owners and the conversation we had with Brittany folks was this. If your battery

powered vessels are simply going to come in and plug it in so it's cheaper fuel to cross the channel, we're not going to invest 20 million, because we're not interested in just saving you a little bit of money. If you tell us that you're going to use battery motive power from the fairway buoy inwards, so that you are not running your own Carbon kits at all, you're simply running on electric, then we will put the 20 million pounds worth of kit in because air quality is the big thing in all ports. It's interesting, air quality for us is really touchstone, carbon reduction comes with it. But again, it comes for our stakeholders being the people of Portsmouth, that we can have these conversations and a boss who lets me do it. So yes, the relationships internationally, it's keeping an eye on regulations. Locally, it's talking to the ship owners and ship charterers.

Matt

Thanks so much, Jerry, and the same question to Marlene and really. How does Aberdeen fair in the international market? And are you keeping a close eye on the competitors abroad?

Marlene

So yeah, I mean, certainly keeping a focus on what's happening in other locations is important. It helps if we have relationships with other locations, other ports, and we can share information, we can share learnings, we can capture best practices. Some of the elements we've been focused on are obviously around shore power. And Scandinavian ports are obviously making huge inroads into that in terms of their usage, their knowledge and their learnings. Now we're availing a lot of that information and knowledge directly, but also through linkage with the catapults with IUK and enabling that piece of dissemination to move forward. But we're also noting as we talk with other areas, that a lot of their drive comes from support from the government level. You know, if you look to Norway, they've set targets within their domestic shipping sector for emissions reductions. And so they will support the organisations within the maritime sector to help get to that level. They've set up a green shipping programme back in, I think it was 2015. It's a public private partnership to drive the strategies. So they want to take a leadership position in efficient and environmentally friendly shipping. I know in Denmark as well, there's also a collaborative programme where they're looking at short to long term solutions, that will lead to zero emission maritime transportation as well. But again, all of these are, there's a drive from the government and from the environmental bodies within the government agencies to push that messaging and that need. And then there's a level of support there too. And I'm not having a pop at the governments per se, I'm just flagging what we see as best practice and perhaps we need to look at those best practices to support the ports in the maritime sector in the UK, and help us take another sort of quick leadership position around that too.

Matt

Thanks very much. And I think that the establishment of UK Shore is a step in the right direction, as they steer us towards this course to zero, and initiatives such as the CMDC and Zebby competitions. And hopefully the refresh of the clean maritime plan later this year, will give us a clear direction that will enable not only the UK to catch up with perhaps the Scandinavian countries, maybe even Singapore, but forge on ahead of them. That's at least my hope. So, with that being said, I'll draw the podcast to a close. Thank you very much for joining us - the audience and also to our guests. Please make sure to check out the Maritime and Ports Innovation Networks section of the KTN website. Also, for latest funding opportunities, news announcements and events to get involved with in the sector. Last but

not least, a massive thank you to our guests Elly, Jerry from Portsmouth and Marlene from Aberdeen. Make sure to reach out to them and their respective organisations on LinkedIn or through their organisational websites. Thank you very much everyone for listening. See you in the next episode.

Outro Jingle

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